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The Stewart Lectures.

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II.

PROTOZOA AND DISEASE.

It is my intention to introduce to you in this lecture some of the representatives of that large group of parasites, the parasitic protozoa, which give rise to many and varied diseases, and which have only been studied thoroughly within the last fifteen years.

Phylogenetically, the protozoa are placed between plants and animals, and it is the general opinion that no one feature separates the lowest plant from the lowest animals, and the difficulty—in many cases the impossibility—of distinguishing between them is clearly recognized.

The protozoa correspond in their anatomical structure to the units which build up the body of the multiple-celled metazoa, and, like animals and man, they consist of cytoplasm or protoplasm, which is considered to be the carrier of the activities which constitute life, and of a nucleus or a number of nuclei to which different functions are attributed.

Morphologically, protozoa do not show any differentiation into different organs, but within the confines of the single cell are carried on all the essential vital functions which characterize the many-celled animal; nutrition and multiplication are carried on by the one cell.

There are numerous protozoa all over the world in water and dust, leading an independent existence, as, for example, infusoria. There are other protozoa lead a facultative parasitic existence, in other s, live symbiotic in and with their host, without using any harmful effects; and there are finally he parasitic protozoa, which live in the host to its detriment, and which are of special interest, since they are the cause of many and varied diseases. Amongst such diseases caused by protozoa may be mentioned amœbic dysentery, malaria, leishmaniasis (kala-azar and Oriental boil). They are the cause of sleeping sickness and of numerous diseases in stock. There are a great number of species which live in the blood of wild animals and birds. Others, like the *Coccidia*, invade the epithelial cells of the intestine of different species of animals, and emigrate from the intestine into the liver, causing extensive and marked lesions in this organ. Many of the representatives of another branch—the *Neosporidia*—cause extensive skin lesions in fishes, and have been found in the intestines of insects.

The majority of the parasitic protozoa belong to the large class of *Sporozoa*, so called because they multiply, in one stage or another of their life-history, by spore formation.

Parasitic protozoa differ in many ways in their action upon their host from bacteria. Bacteria, as a rule, multiply within the host until they have overcome his resisting power and caused his death, or until the host has been able to form anti-bodies, a poison counteracting the bacteria and their products, in sufficient quantity to retard their further multiplication and to accomplish their annihilation.

Blood protozoa, on the other hand, undergo, as a rule, a series of definite changes called the life cycle in the warm-blooded host, and morphologically different forms are found at different stages of the disease in varying numbers.

The parasite of benign malaria, for example, enters, in its youngest stage, the red blood corpuscles of its host. It has the shape of a signet ring, consisting of cytoplasm and the nucleus. Soon after the parasite has entered the blood corpuscles, the whole parasite increases in size; very soon the chromatin of the nucleus breaks up into numbers of particles, which collect a certain amount of cytoplasm around themselves, and after a varying period —in benign malaria about forty-eight hours—the blood corpuscles which contain the parasites burst open and the young spores become free, and soon afterwards attach themselves to new red blood corpuscles, enter them and begin the same cycle anew.

The parasite of sleeping sickness, *Trypanosoma gambiense*, undergoes a developmental cycle analogous to the malaria parasite. At a given time the peripheral blood of man may contain an enormous number of parasites. If the blood of the same men be examined one hour or so afterwards, the parasites may have disappeared so completely that even the most diligent search will not reveal the presence of a single parasite, and it may be days, weeks, and often months before the parasite can again be found in the same patient. This negative interval coincides, as a rule, with a considerable subjective improvement.

All the observations on the life history of the pathogenic protozoa seem to prove that there must be a close relationship between the action of the parasite on the host and the reaction of the host to the presence of the parasite, and open up a wide field for original work, namely, on the nature of immunity against protozoa and its relation to the life cycle of the parasite. In spite, however, of the strenuous efforts of a great number of highly-skilled observers, our knowledge has not progressed very far in this direction.

The nature of bacterial immunity is fairly well understood at present, although all our knowledge of bacterial immunity is based on a number of working hypotheses which may be overthrown at any time. Yet these hypotheses have enabled us to bring all our facts into line, and to make many new and important discoveries.

Protozoic immunity differs essentially in one respect from bacterial immunity. As pointed out pre-

viously, bacteria only occur in one shape and form and stage in the organism. Protozoa, on the other hand, occur in different shapes and forms and stages, and whilst at one stage of the infection the organism has been able to combat one phase of the parasitic invasion, the parasite is able to undergo morphological changes in such a way that the body has to bring forth new efforts in order to counteract the effects of the parasite in its new phase.

A graphical chart of the infection of an experimental animal with the parasites of sleeping sickness, *Trypanosoma gambiense*, an infection which, on the whole, runs an analogous course to the trypanosome infection in man, will illustrate this statement. In the diagram the horizontal figures represent the days of inoculation; the vertical figures the number of parasites in a microscopic field of blood.

If a small number of trypanosomes be inoculated into the abdominal cavity of an experimental animal, multiplication sets in, and after a certain time the parasites enter the blood stream of the animal. Even the most careful examination of the animal's blood during the first few days does not reveal the presence of trypanosomes; the animal is in the incubation period. After a varying interval, which, on the whole, corresponds to the number of parasites injected, the parasites have become numerous enough in the peripheral blood of the experimental animal to be detected by microscopical examination. They continue to multiply, reaching their first maximum number after a few days. Suddenly the parasites disappear, and for days, sometimes weeks, no trace can be found in the peripheral blood of our animal. After a varying interval, however, the parasites reappear again, at first in scanty numbers, then multiply and reach a second maximum, which may or may not be slightly higher than in the first instance. After this second maximum the parasites disappear again, and a second negative phase is observed. This play and counterplay repeats itself more or less often until the parasites become so numerous that the peripheral blood is swarming with them, and at this stage the animals succumbs to the infection.

The question of the fate of the parasites during this negative interval was difficult to solve. Careful observations of the blood and organs, carried out over prolonged periods, revealed the fact that the parasites undergo morphological changes at the time when the first maximum in numbers is reached. The parasite of sleeping sickness, *Trypanosoma gambiense*, possesses two nuclei, a small one situated at one end and a larger one placed in the centre, the former in all probability controlling the vegetative function of the cell, the nutrition, and the latter the reproductive function. At a time when the parasites begin to disappear from the peripheral circulation an interaction takes place between these two nuclear structures, a chromatin band grows from the smaller nucleus to the larger one. This phenomenon can, however, only be seen in an extremely small number of parasites. The majority of them undergo disintegration, the cytoplasm becomes vacuolic, and the majority of the parasites break up, and the fragments are eaten up by the phagocytes, the policemen of the blood. If we take the blood serum at this stage of the infection and mix it with parasites taken from another animal, but in an earlier stage, then we find that the serum acts in the test tube in exactly the same way as in the body, and we may observe under the microscope that the parasites are destroyed.

With regard to the smaller number of parasites in which the interaction between the two nuclear structures has taken place, a further development takes place. The cytoplasm of these parasites becomes denser, the chromatin of the nucleus becomes more concentrated, and the smaller forms which result, consisting of a nucleus and a small ring of cytoplasm, take refuge in the spleen and bone marrow, and there lie dormant for varying periods awaiting the opportunity to begin life again and give rise to a new generation of parasites. These forms have rightly been termed "latent bodies," as they are the parasites of the "latent stage of the disease."

The observation that the serum taken at the crisis (that is, at the time when the parasites begin to disappear) causes the destruction of other parasites of the same species, seems to prove that a formation of certain immune bodies, antagonistic to the parasite, and therefore termed "antibody," has taken place in the serum, and that these are the cause of the disappearance of the majority of the parasites from the blood. The presence of this immune body in the serum is unfortunately only of short duration. In the course of a longer or shorter space of time these "antibodies" are excreted or broken up, and give the parasites an opportunity to leave their hiding place with impunity.

In the case of sleeping sickness, the faculty of the host to produce substances which are harmful to the parasites seems only to be a limited one, since after several attacks and latent periods the resources of the animal organism become exhausted, giving the parasite the freedom to multiply indefinitely and cause the death of the host.

The foregoing observations show that protozoic immunity is intermixed with, and dependent on, the life history of the parasite, and *vice versa*; in other words, in protozoic diseases, the parasites act first upon the animal organism, which reacts in a protective sense, and forces the parasite to undergo a further development in its life history.

Similar and analogous changes take place in the case of infections with the parasite which causes relapsing fever in different parts of the tropics, and is called *Spirochaeta*, an extremely small, thread-like body. In cases of relapsing fever, active and latent periods follow each other at varying intervals, clinically characterized by attacks of fever and feverless periods. The spirochætes, which are present in enormous numbers in the blood during the fever period, suddenly disappear completely, only a few of the parasites coiling themselves up in the cells of the liver and spleen, which, as soon as the elements in the blood serum hostile to the parasites have ceased to exist, break up into numerous fine particles, out of which the new generation develops.

Other protozoa, especially the non-pathogenic protozoa, which live in the host without causing injury —as, for example, *Trypanosoma lewisi*, a parasite of

the common wild rat—differ in many respects from the pathogenic trypanosomata. These parasites, after they have entered the animal host, multiply slowly, are present during the whole duration of the infection, and finally disappear. Even in these cases the multiplication during the first stages of the infection differs from that of the later stage. Whereas in the early stages the multiplication takes place by segmentation, one parasite breaking up into a number of smaller ones, in the later stage multiplication takes place by simple fission, each parasite splitting into two daughter cells. Morphological differences in the parasites are well marked in different stages of the infection, and tend to lead to the conclusion that the animal body has produced substances which have forced the parasites to change their tactics and morphology.

Malaria parasites differ in many respects from trypanosomes. It is a well-known fact that the fever caused by the malaria parasite (simple tertian form) is an intermittent fever—fever to-day, a feverless interval the second day, and fever again on the third day. During the febrile interval, parasites are either absent from the blood or only present in certain stages, the sexual stage referred to later. The rise of temperature always corresponds with the sporulation of the parasites, that is, to the period when the blood corpuscles break up, setting free numberless small forms, the schizonts, which attack new blood corpuscles, develop in them and repeat the same life-history over and over again. A great number of these small parasites must perish, otherwise the human organism would succumb to the number of parasites at a very early stage of the infection.

In the normal course of malaria, if the patient be not treated, relapse follows relapse; the clinical symptoms, such as anæmia, enlargement of the spleen, and wasting, as a rule, become more marked with each relapse, a slight improvement taking place during the interval. After some time, however (several months), the symptoms reach a fixed limit, and the patient shows the typical clinical picture of chronic malaria, anæmia with its accompanying œdema, and with enlargement of the spleen. In many cases, especially in native children, improvement sets in after the symptoms have reached the fixed limit. The relapses lose their regularity, the feverless intervals become longer and longer, the clinical symptoms become less marked, but on examination parasites can still be found in small numbers in the blood. Complete recovery may take place, followed by a partial immunity.

A practical illustration of the condition referred to can be found in any native community where the natives live in villages. One of the most constant symptom of malarial infection is the enlargement of the spleen. On examining the children living in a malarial district, from baby to about four or five years, enlargement of the spleen may be found in as many as 90% to 100% of all the children examined, and this enlargement becomes less marked in the older children.

One may often examine a great number of adult natives in the same village without finding any signs of latent malaria, and this occurrence proves that the human organism produces an immunity against the malaria parasite. In other words, when infection had taken place, especially in early childhood, the malaria parasite, which has been a true parasite at first, has become a saprophyte, and although still present in very small numbers, does not cause clinical symptoms. It is, however, remarkable to note that this equilibrium between body and malaria parasite is very unstable, and may become easily disturbed. Any of the conditions which cause the slightest lowering of the resistance of the human body may give rise to a typical attack of malaria. There are cases on record where, even after a fever-free interval of from four to six years (the person had been living in a malaria-free country) malaria parasites have made their appearance again at a time when some other disease had lowered the vitality of the patient. This also accounts for the fact that in many instances malaria fever attacks can often be noticed after the infected person has left the malaria district. It is of common occurrence that people returning home from the West Coast of Africa, after a stay of one or more years, show the first signs of fever when nearing Gibraltar, whilst persons who have been resident in New Guinea for quite a long period have noticed their first attack on their arrival in Queensland during the winter. During my travels I have repeatedly noticed that the native servants, who hailed from a malaria district but seemed free from fever, had severe attacks after a heavy wetting, and invariably the precaution was taken to administer quinine prophylactically after an uncomfortable day.

Similar to the malarial immunity is that produced in bovine piroplasmosis, tick fever in cattle. It is well known that the infection of tick fever in cattle runs a mild course if the parasite invades young animals, whilst older animals succumb, as a rule, to the infection. If the infection takes place in a young animal, a permanent immunity is conferred upon this beast. Parasites can, as a rule, be found for a whole year after the onset of the disease, if not by direct microscopic examination, at least by sub-inoculation experiments of the blood into a susceptible animal.

Protozoic immunity is a very difficult problem indeed, and the advances made up to now are only slight. At the same time, it is a very important problem, as an insight into the ways and means nature employs to overcome protozoic infections may lead to the successful treatment of the disease in question, in the same way as the advance in our knowledge of the mode of production of bacterial immunity, has done so much to make diseases such as diphtheria and lockjaw easily amenable to treatment. The investigations into protozoic immunity on the lines of those employed in the case of bacterial immunity have, up to now, completely failed, and new methods and modes of reasoning have to be devised to further our knowledge of this subject.

Protozoa differ in other respects from bacteria in that they are transmitted by some biting insects, which act as intermediary host, passing through defi-

nite changes within the insect. For example, the tsetse fly, *Glossina palpalis*, acts as intermediary host to the sleeping sickness parasite, different species of anophelines as intermediary host for the malaria parasite, ticks, as *Ornithodorus moubata*, as intermediary host for the African relapsing fever, and various *Boophilus* as intermediary host for the tick fever in cattle.

Taking, however, into account the complicated structure of protozoa, and comparing it with the comparatively simple structure of bacteria, it becomes apparent that nature had to take careful precautions for the preservation of the species.

Investigations into the life history of protozoa have taught us that the parasites undergo a rejuvenation in the intermediary host, and have shown us that there are in nearly all protozoa which have been carefully investigated, two distinct and different life cycles—one life cycle in the body of the host, and a second quite distinct life cycle in the intermediary host. The former life cycle is an asexual cycle, the parasite multiplying by fission; the latter is a sexual life cycle, whereby an interaction takes place between two different and morphologically well-characterized forms, the male and the female. The result of this interaction is a single form, the fertilized gamete. In most of the parasitic protozoa, even in the definite host, the two forms, the male and the female gamete, which take part in the sexual cycle, may be found in the blood at certain stages of the infection. A few of the parasites, especially after the infection is well established, undergo a slightly different development from the asexual parasites, and forms may be noticed corresponding to the female and male gametes, which are more resistant to treatment and persist a long time even after the disappearance of the asexual forms in the blood.

I will give, as an illustration, the life history of the malaria parasite, *Plasmodium vivax*, in its intermediary host, a certain mosquito, an anopheles, of which only a limited number of species are capable of offering the malaria parasite a welcome home for further development. The sexual forms are taken up with the blood of patients by the female mosquito. The female gamete, or macrogametocyte, escapes from the red blood corpuscles after it has reached the intestine of the mosquito, and undergoes changes in some respects analogous to those which take place in the germ cells of the metazoic organism. The nucleus divides, and some of the chromatic particles leave the cell; the nucleus of the macrogametocyte has undergone reduction division, and has become a macrogamete.

The microgametocyte, the male element, changes in a similar way. The chromatin of the nucleus breaks up into a number of particles which migrate to the periphery of the cell. Shortly afterwards fine whip-like filaments called flagella shoot out from the periphery of the cell, which lash about and show lively movements. These small filaments finally break off and form microgametes—the male element. Each microgamete consists of a filament of cytoplasm, over which is spread the chromatin in small dots.

Soon after the formation of the microgametes, the male and female elements conjugate, the nuclei fuse, and the fertilized parasite called the *Ookinete*, elongates and becomes pointed at one end; the pigment is placed mostly at the posterior end of the parasite, and is often thrown out.

At this stage the parasite penetrates the lining of the stomach of the mosquito and comes to rest on the outside of the stomach, surrounding itself with a thin membrane. The parasite now begins to grow at a great rate, the nucleus divides into a large number of daughter nuclei, which form the sporoblasts; afterwards the chromatin of the sporoblasts divides into a great number of smaller chromatin particles, which move towards the periphery and cause numerous projections. This cyst, which has increased in size considerably, now bursts, and the contents escape into the body cavity of the insect and are carried by the blood stream of the insect throughout the whole body, and finally find their way into the salivary glands. This process in the mosquito takes 10 to 12 days.

When the infected mosquito feeds on a second person, the small parasitic forms pass from the mosquito into the blood stream of the person by way of the wound, attack the blood corpuscles of the new host, and begin to multiply.

From this description it is apparent that the parasites of malarial fever have to undergo complicated changes before being able to enter the new host.

Many of the other protozoa undergo a complicated development in the intermediary host, but none of the life history is as definitely known as that of the malaria parasite.

Trypanosomes most probably undergo a sexual development in the tsetse fly, which, however, is not yet clearly understood. The life cycle of one species of trypanosoma, *Trypanosoma lewisi*, found in the wild rat, is better known. The trypanosomes are taken up with the blood by the rat louse, grow larger, and resemble morphologically forms which occur as "wild parasites," harmless lodgers in different insects.

The work of the life history of parasitic protozoa through the intermediary host is complicated by the occurrence of other parasites in the respective insects, which resemble morphologically the changed form of the parasite in question.

For example, two trypanosomes, *Trypanosoma grayi* and *tullochi*, which occur commonly in the tsetse fly, resemble closely that of sleeping sickness in some of its stages.

The fact that parasitic protozoa resemble in many stages of their life history other protozoa which live as harmless commensales in the body cavity of different insects, is a very suggestive one, as it seems to point to the conception that parasitic protozoa have been evolved in the course of time from originally harmless parasites, which were taken up

by insects and became non-parasitic commensales before acquiring their parasitic habits.

In the tropics a great percentage of all the animals, mammals, birds, and reptiles harbour parasitic protozoa, which, although morphologically very similar, often even identical, are specific for the species of animals in which they occur. For example, *Trypanosoma gambiense*, the sleeping sickness parasite, and *Trypanosoma brucei*, causing the tsetse fly disease in cattle, are morphologically nearly identical, biologically quite different. The sleeping sickness parasite only causes slight and transient infections in horses and cattle; the cattle parasite never causes infection in man. Most of the various blood parasites which inhabit the blood corpuscles of lower animals and birds are specific for the species in which they occur, never being able to live and multiply in any other species.

The diseases caused by parasitic protozoa occur mostly in tropical climates. The most important disease is malaria, which occurs nearly as far as the tropics extend. There are at least three different varieties of the parasite of malarial fever—the quartan, simple tertian, and malignant tertian parasite. The quartan sporulates every fourth day, and causes rise in temperature, rigor, etc.; the simple tertian sporulates every other day, and the malignant tertian parasite runs a more or less irregular course.

Sleeping sickness is caused by *Trypanosoma gambiense*, a protozoan belonging to the large group of the *Haemoflagellata*. Sleeping sickness has spread throughout many parts of Africa with a tremendous mortality, depopulating whole districts. It is a very chronic disease, characterized in its early stages by a marked swelling and inflammation of the lymph glands. In the later stages the brain becomes attacked, and the round celled infiltration in the perivascular lymph spaces gives rise to the mental stupor and drowsiness from which the disease gets its name.

Kala-azar, a disease due to a micro-organism, *Leishmania donovani*, occurs in India. Patients show a great enlargement of the liver and spleen, and emaciate to a skeleton. The fever is irregular and persistent. This disease is always fatal. A morphologically similar parasite is the cause of *Leishmaniosis infantum*, a form of the disease which attacks mostly infants, and shows as clinical sign a great enlargement of the spleen, which is followed by well-marked emaciation.

Similar parasites cause the lesion known as Oriental boil, a slowly-spreading ulcer on different parts of the body, occurring in Bagdad, Delhi, Brazil, and other parts of the world.

Spirochætes are too well known as disease producers. Syphilis, yaws (a children's disease amongst the black inhabitants of the tropics), the different forms of relapsing fevers, the African, Indian, European, American, are produced by spirochætes. Parasites which give rise to amœbic dysentery belong to the phylum of the protozoa, and show a fairly wide distribution throughout the tropics.

It is clear that protozoa play a very important rôle in nature, and their economic importance cannot be underestimated.

In spite of the enormous amount of work which has been done within the last decade, we are still only on the threshold of knowledge of this large group of parasites, and I am convinced that as our knowledge increases, a good many of the diseases of unknown ætiology will in future be proved to be caused by parasitic protozoa.

SOME OBSERVATIONS ON THE DIAGNOSIS AND SURGICAL TREATMENT OF PYURIA.

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Part II.

(*b*) Cystoscopic Removal of Ureteral Calculi.

The development of the technique for removal of calculi in the ureter through the cystoscope is the latest achievement in the conservative surgery of the urinary organs. For its development we are indebted to the skill and ingenuity of American surgeons, and of their instrument-makers.

It is now many years ago since the possibility was demonstrated of removing a stone from the lower end of the ureter in the female by the open air cystoscope of Howard Kelly. It is only quite recently, however, that the method has become practically applicable, through the introduction of the modern operating cystoscope, with the flexible operating instruments, for use through it (Fig. 5). It is now possible, in favourable cases, to remove stones, up to the size of a pea, or slightly larger, from the vesical and juxta-vesical portion of the ureter, either by forceps alone (Fig. 5 *c*), or aided by scissors (Fig. 5 *d*), and by ureteral dilatation with large-sized catheters, to facilitate the natural expulsion of small, impacted stones situated higher up. The method of oil or glycerin injection through a small bore catheter has, of course, long been known. It is, however, alone, so rarely successful as to be of no great practical importance.

It has been shown by numerous experiments and measurements that the ureteral meatus may be slit up on its bladder aspect to the extent of a half inch with perfect safety. This little operation is termed *ureteric meatotomy*. It is quite easily accomplished through the operating cystoscope with scissors (Fig. 7) set on a flexible stem. It will, in some cases, enable stones which are too large to pass through the bladder wall and ureteral meatus unassisted, to be readily grasped with forceps (Fig. 9) and withdrawn into the bladder, whence they can be either extracted with the forceps through the cystoscope, or, if too large for this, removed by a Bigelow's evacuator attached to the sheath of the cystoscope (Fig. 5 E). The forceps used are of such calibre and flexibility that they may be passed up a normal ureter for a distance of 1½ inches. They can also be used as a ureteral dilator by separating the blades during withdrawal.

If a stone be presenting at the ureteral orifice, it may be quite easy to remove it with the forceps.

Failing this, or if it be situated higher up, and appear as a hump in the bladder in the line of the ureter (Fig. 6), either the ureter may be dilated and forceps inserted, or, preferably, ureteric meatotomy be performed (Figs. 7 and 8), and the stone grasped with the forceps and removed (Fig. 9).

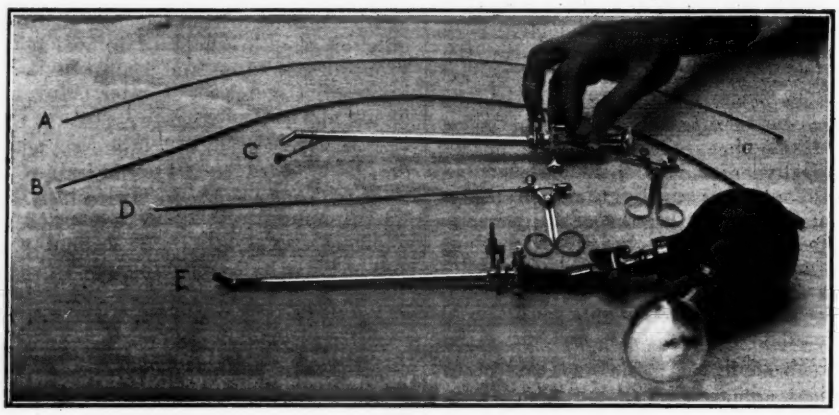

Fig. 5.

Instruments for the Cystoscopic Removal of Ureteral Calculi. (A) No. 6 F Ureteral Catheter, the size in common use, shown for comparison with (B) No. 11 F. Ureteral Catheter, for Ureteral Dilatation and Drainage of Pus from the Kidney. (C) Flexible Forceps, introduced through the Operating Cystoscope, and shown grasping a Stone. (D) Flexible Scissors. (E) Bigelow's Evacuator, attached to the Sheath of the Cystoscope.

The slit in the ureter rapidly heals up. In the few in which I have had an opportunity of making a cystoscopic examination at a later stage, the appearance and movements of the ureteral orifice have differed not at all from the normal.

I have had constructed some silver olive tips in graduated sizes and fitted on flexible stems, which are of occasional service.

A large ureteral catheter, No. 11 French (Fig. 5 B) is extremely useful in some of these cases, both for ureteral dilatation and for drainage of pus. In cases of pyonephrosis and of pyelitis (whether due to stone or pregnancy) it can be retained in the kidney in many cases for a surprising length of time with great benefit and without inconvenience to the patient. Large quantities of pus (often under considerable tension, as shown by the flow through the catheter) are thus readily and rapidly evacuated, and antiseptic irrigations and injections employed. I have on numerous occasions been able to keep the catheter continuously in position for a number of days, until such time as the kidney has resumed approximately its normal function, the patient at the same time being relieved of a pre-existing sepsis. This, in simple cases, such as those due to pregnancy, generally suffices for permanent relief, while in others the patient is placed in incomparably better condition to withstand operative intervention. The superiority of this large size of catheter, which is as a rule readily admissible into the ureter, over the usual size (Nos. 5 and 6 French) will be apparent. The longest period of retention of the catheter in the kidney in any of my cases has been fourteen days (*vide* Case III.). But many cases are on record where it has been retained with advantage for even longer periods.

Illustrative Cases.

Case I.—Pyuria: Stone Impacted in the Vesical Portion of the Ureter; Cystoscopic Removal.

R.W., male, æt. 32, asylum attendant, had suffered from frequent attacks of renal colic and painful micturition, which had more or less incapacitated him from work for the past five years. He stated that he was merely the shadow of his former self. He had been told that he had a tubercular kidney. There was a considerable amount of pus in the urine, and a mixed infection. X-ray examination showed a shadow well below and outside the normal region of the pelvic segment of the ureter (Fig. 10), which suggested a phlebolith. Cystoscopic examination showed a tumefaction in the line of the left ureter, about ⅓ inch above the ureteral orifice (Fig. 6). An entering catheter was also obstructed at this point.

The ureteral scissors were then inserted through the cystoscope, and the ureter slit up for a half inch, and a stone was found lying snugly in the bed of a stricture (Fig. 8). It was grasped with forceps and gradually freed from its bed, where it was adherent. This was followed by a gush of purulent débris. The stone (Fig. 10) was too large to remove from the bladder through the cystoscope with forceps. A Bigelow's evacuator was therefore attached, and the stone removed without any difficulty.

I heard from the patient six weeks ago, *i.e.*, two months after the removal of the stone. He stated that he felt as well as he had ever felt, and had gained nearly two stones in weight.

Case II.—Pyuria: Stone in the Pelvic Segment of Each Ureter; Stricture of the Urethra.

S.E., male, æt. 42, seen with his medical attendant at a private hospital on December 3, 1914. He was suffering with persistent attacks of left-sided renal colic, which necessitated frequent injections of morphine. X-ray examination (Fig. 11) showed two shadows, one on the right side, close to the vesical orifice of the ureter, the other on the left side, some two inches higher up. Each stone was very small, and we hoped to effect their removal by cystoscopic means. It was, however, found impossible to pass the cystoscope, on account of a stricture of the urethra in the region of the bulb, the result of a former gonorrhœa. An operation was accordingly decided upon. The transverse suprapubic incision (*vide* Fig. 2, Part I.) was used, and a small spiculated oxalate calculus removed from the left ureter, about 2 in. above the bladder. Suprapubic cystotomy was then performed I thought a small stone could be felt pubically, 40 small stones were removed from the *bas fond*. Intraurethral enucleation of the prostate

through the right ureteral orifice, but, if so, it immediately disappeared, and no further search was deemed advisable. The right ureteral orifice was, however, slit up over a bent probe for a distance of ½ inch, in the hope that the stone would pass naturally at a later time. A small rubber catheter, mounted on a guide, was then passed down through the urethral stricture, and a small rubber tube sewn into the fundus of the bladder. A rubber dam wick was placed down to the left ureter, and the rest of the wound sewn up firmly.

Recovery was uneventful, except that the urethral catheter had to be retained off and on for three weeks, on account of recurring attacks of retention of urine.

I had the opportunity of seeing this patient four months later. He brought with him a small, hard, spiculated stone, similar to the one removed at the operation. He stated that he had passed this stone six weeks after leaving the hospital. A No. 14-17 steel sound passed easily into his bladder.

Case III.—Bilateral Pyonephrosis, Following Operation for Retrovertion of Uterus.

M.M., single, æt. 41, was referred to me on October 24, 1914, with a rather remarkable history, by the surgeon who subsequently performed the nephrectomy. An Alexander's operation had been performed in another State, six months previously. She had had post-operative retention of urine for three days, and had then been catheterized frequently. A severe infection with *b. coli* resulted. She was in bed for five weeks. Vaccine treatment and bladder irrigations had been persevered in for some three months before her return to Sydney. She was then having rigors every seven or eight days, with fever up to 103° and 104°. She had lost nearly three stones in weight, and had a yellow, earthy pallor. The only localizing symptoms were some slight pain and frequency of micturition and aching in the left loin at the time of the rigors. Physical examination had suggested a focus of infection in the left kidney, manifested by occasional indefinite swelling and tenderness in the left loin. Removal of the left kidney was contemplated, but there was considerable doubt as to the viability of the right kidney.

Cystoscopic examination showed a chronic, generalized œdema of the bladder mucosa. A No. 6 catheter passed without obstruction to each kidney. The urine collected from each side was turbid with pus, that from the left side being by far the worse. The pelvic capacity of the right side was 1½ ounces, that of the left considerably more, though no more was injected at this time. The indigo-carmine test showed a faint green tinge in the urine from the right side; while the urine from the left kidney was not coloured. The urea excretion was 0.5% from the right side, and less than 0.1% from the left. A pyelogram was taken of the left kidney. It showed a large pyonephrosis, with a stricture of the ureter just above the bladder (Fig. 12).

We were confronted with a totally disorganized left kidney and a small, pyonephrotic right kidney, with marked diminution of its function. This last was considered as probably toxic in origin, and therefore amenable to treatment, if we could prevent absorption from the left pyonephrotic sac. Subsequent events proved the correctness of this surmise. The largest size ureteral catheter (No. 11 French) was passed through the left ureter up to the kidney, just squeezing through the ureteral stricture. It was then fixed snugly in position. It was kept *in situ* practically continuously for fourteen days, being only removed for a few hours on two occasions, in order to test the functional efficiency of the opposite kidney and for purposes of sterilization. The left kidney was found to contain just over one pint. A daily average of 60 ounces of thickly purulent urine drained from this kidney, with a specific gravity of 1,000. The amount collected from the opposite side averaged roughly 20 ounces *per diem*, with a specific gravity of 1,005.

At the end of the first week there was a marked improvement in the indigo-carmine excretion from the "good" kidney. At the end of a fortnight the excretion was just below the normal, and the urea had reached 1.5% (*i.e.*, just below normal). During this time, there had been a gain of 3 lb. in weight, and the temperature had only once exceeded 100°, reaching 100.5°. There was also marked improvement in the general condition. There was still no indigo-carmine excretion from the left kidney.

A nephrectomy of the left kidney was then performed, with tolerable certainty as to the sufficiency of the right kidney. Figures 13 and 14 show a drawing of the left kidney after removal. It was a mere sac, with just a trace of renal tissue in its upper pole.

Following operation, there was a steady improvement in the general condition. However, after the lapse of six weeks, the urine was still very turbid, with a specific gravity of 1,005, a trace of albumin and a few pus casts. The temperature remained normal. Four ureteral catheterizations were then carried out on the remaining kidney at weekly intervals, the catheter (No. 11 French) on each occasion being retained for 12 to 24 hours. On this side also there was found a relative contracture of the ureteral lumen, just above the region of the vesical orifice, as determined by the passage of olive-tipped bougies. Injections of 1 oz. of a 2% protargol solution were made every two hours, while the catheter remained in the kidney.

At the end of this month the patient had gained nearly 1½ stones in weight. The amount of urine in 24 hours was 54 ounces; there was no albumin and the casts had disappeared. The specific gravity was 1,010, the indigo-carmine test normal, urea 1.5% and the urine clear, except for some granular débris. The pelvic capacity was a little over 1½ ounces.

During the past three months she has continued to improve steadily. The bladder urine is now free from macroscopic abnormalities. She has received throughout and is still receiving injections of an autogenous *bacillus coli communis* vaccine.

Case IV.—Pyelitis During Two Successive Pregnancies, Due to Large Stone in Renal Pelvis; Pyelolithotomy.

M.P., married, æt. 26, seen in consultation with her medical attendant on December 12, 1914, and sixteen days after delivery of a six months macer-

ated fœtus. The history was that she had had severe pyelitis on the left side during the last six weeks of the past pregnancy, and a similar but less severe condition during her only previous pregnancy, eighteen months earlier. I was asked to see her with a view to therapeutic ureteral catheterization. There were three unusual features about the case when I first saw the patient: (*a*) The localization of the pain on the left side, which is extremely rare in *pyelitis gravidarum*. (*b*) The pain was immediately relieved by recumbency. (*c*) There was no pus in the bladder urine, even on microscopic examination. However, the localization of pain and tenderness were quite definite in the left kidney region, though the organ itself was not palpable. She was then admitted to the South Sydney Women's Hospital. Ureteral catheterization was performed, and showed a remarkably small pelvic capacity on the left side, less than 3 c.cm. being retained. The indigo-carmine test was normal, and the urea excretion 2% (*i.e.*, normal). The urine was sterile on culture, and contained no abnormal elements. It was quite evident that there was present neither pyelitis nor hydronephrosis. An X-ray plate was then taken and revealed a dense, rounded, oval stone, the size of a large pigeon-egg (Fig. 15) in the left kidney area. At the operation, this was found to fit snugly into the renal pelvis, the kidney itself being quite normal in size and appearance. The stone was easily and bloodlessly removed through an incision in the renal pelvis, which was very much thickened. The incision in the pelvis was closed in two layers with fine catgut and a flap of kidney capsule reflected and sewn over it. The wound was sewn up without drainage. Union occurred *per primam* and without any urinary leakage. The patient left the hospital on the fourteenth day in good condition.

The unusual features of this case were the absence of pus and blood cells in the urine at the time of examination and the remarkable tolerance of the kidney of a large stone in its pelvis, the organ itself showing no visible organic or functional derangement, the *locus minoris resistentiae* only becoming evident in the successive pregnancies.

Case V.—Pyuria; Intestinal Stasis; Early Tubercular Peritonitis; Quiescent Pulmonary Tuberculosis (?).

H.M., æt. 33, dentist, had been going rapidly down hill for the past six months, despite numerous trips to health resorts and other treatment. When he first came for examination, he had the typical appearance and syndrome of intestinal stasis. A well-known physician had found some scanty signs of pulmonary tuberculosis on the right side, which was partially confirmed by X-rays. There were numerous vague abdominal symptoms, and physical examination revealed well-marked tenderness in the right iliac region. There was increased frequency of micturition, especially at night-time. The amount of urine was increased, averaging about 75 ounces *per diem*. Urinalysis disclosed numerous pus cells, a few blood cells, a heavy deposit of phosphates in an alkaline urine, and a trace of albumin. The specific gravity was 1,010. The urine was sterile. Repeated search failed to reveal any tubercle bacilli. Cystoscopically, the bladder was seen to be normal. The urinary findings from each kidney were identical. A bismuth meal gave a beautiful demonstration of obstruction of the ascending colon, the *caput coli* being sharply cut off from the rest of the ascending colon (*vide* Fig. 16).

A review of these findings suggested the possibility of his present condition, as well as his urinary symptoms, being mainly dependent on the intestinal stasis. It was accordingly determined to give him the benefit of relief of the obstruction. The operation was performed at a private hospital on December 12, 1914.

Figure 17 shows the condition found at the operation. The fine membranous veil seen was the cause of the obstruction, the caecum below it being markedly ballooned and congested. Very remarkable was the finding of 15 to 20 miliary tubercles peppered over the caecum, around the base of the appendix. This was of the greater interest, in view of the doubt surrounding the patient's pulmonary condition.*

The appendix, as shown, was caught up by the pericolic membrane. It was removed, the veil divided vertically, the omentum tied off in sections and the *caput coli* pleated longitudinally by uniting the anterior and external longitudinal bands by a continuous silk suture, up to the line of the former obstruction. Convalesence was uneventful. For the next three months he lived up the Blue Mountains. He then returned to Sydney and resumed his practice. His urine is quite clear. The urinary and all other symptoms have disappeared. He looks, as he says he feels, in the best of health.

Case VI.—Pyuria: Prostatic Hypertrophy; Vesical Calculi.

G.J., æt. 74, blacksmith, sought advice with great reluctance, as he had been feeling perfectly well for the past ten days. He stated that he had never had a day's illness until one month before, when, during his morning's work, he had been struck with a severe pain in his bladder, accompanied by great desire to pass water, but without any success. He was induced to lie down, and obtained almost immediate relief. He had no further trouble until he began heavy work again, when there was an immediate return of his previous symptoms, and a small quantity of blood-stained urine was passed. He was again relieved by recumbency. This sequence of events was maintained until he left his home in the country ten days before. Since then he had been free from trouble, except that he had noticed some degree of turbidity of his urine and some increased frequency of micturition. He was able to pass a moderately full stream with very little effort. Rectal examination revealed no palpable prostatic enlargement. Radiography was negative. As I was unable to give him an immediate diagnosis, he was very anxious to return home. After much persuasion, however, he agreed with a very bad grace to submit to a cystoscopic examination. An overhanging middle lobe of the prostate was found, with a cluster of small, dark brown calculi in a deep, post-prostatic recess. He then became quite amenable to reason. I operated upon him at the Lewisham Hospital on December 29, 1914, under anoci-association. On opening his bladder supra-

*Since the above was written, I have operated on this patient's wife for a tubal pregnancy. Both tubes were peppered over with miliary tubercles.

was performed, after the method of Bentley Squier. It was found that two fingers were easily passed into the prostatic urethra; it would have admitted three with very little pressure.

The explanation of his attacks evidently was that exertion forced a stone or stones up from the post-prostatic recess, whence they came to rest in the widely gaping prostatic urethra. That this was sufficiently wide to permit the stones to roll out accounted for the rapid relief from recumbency.

On examination, the stones, which were uniformly the size of a pea, proved to be composed almost entirely of pure uric acid, thus accounting for the negative X-ray findings.

The drawings and radiograms are by Dr. H. R. Sear. With the exception of Fig. 16, all the radiograms have been printed in such a manner that the left side of the picture corresponds to the left side of the patient, and *vice versa*.

Reports of Cases.

NOTES OF SEVERAL CASES OF CLIMATIC BUBO.

By **Staff Surgeon H. J. Brennand, B.A., M.D. (Syd.),** and **Surgeon W. J. Carr, B.A., M.B. (Cantab.),** *H.M.A.S. Melbourne.*

The following brief notes of nine cases of climatic non-venereal bubo, which occurred among the ship's company of H.M.A.S. *Melbourne* recently, may be of interest to those medical men who are serving with the Australian Expeditionary Forces in the tropical Pacific Islands, owing to the liability of the disease being mistaken for *pestis minor*. This ship had previously been to Samoa, New Guinea and the Marshall Islands, all well within the tropics, but no cases of the kind occurred there. At the beginning of February last the ship was on a voyage from Jamaica to Havana, in Cuba, and thence to Yucatan and Honduras. On the fifth day out from Kingston, several sailors reported sick. They were found to be feverish, with temperatures ranging from 102° to 105°, with intense frontal headache, constipation, and general constitutional disturbance. On examination, slight, painful, bubonic swellings were found, either in one or both groins, affecting the oblique inguinal glands, and in two cases the femoral glands also. Careful examination revealed no wounds, scratches or jigger bites on the legs and feet, and no venereal disease was present. Plague was at first suspected, and prompt measures were taken accordingly. Bubonic plague was at the time prevalent in Havana, but the ship had had no communication with the shore there. For several days fever of a remittent type persisted, with occasional rigors at night, sweating and sudaminal rashes, and the patients suffered from restlessness and mental anxiety. The buboes gradually increased in size, but caused little discomfort beyond a feeling of weight, although in some cases they were as large as walnuts, hard, fixed and matted together by periadenitis, and, except in one case, showed no signs of suppuration. An incision was made in this instance, and a few drops of serous fluid exuded. Examination of this revealed nothing but a few diphtheroid bacilli. Deep incision released a tiny drop of pus from the middle of the gland. The pus proved to be sterile. The diagnosis of climatic bubo was made, and on our return from Honduras, this was confirmed by the quarantine authorities at Port Royal. The patients were landed at the military hospital of the West India Regiment, under the care of Majors Weston and Harvey, R.A.M.C., who stated that a few cases had occurred among the garrison men, and also among the crew of a French warship recently. The men affected had all slept ashore in Kingston, general leave having been granted after the long voyage from Gibraltar to Jamaica, viâ the north coast of South America from Trinidad to Colon, and it is possible that the complaint was contracted there at local boarding houses, some of which are suspicious.

Dr. Scott, Pathologist to the General Hospital, Kingston, informed us that no specific organism had yet been isolated. The long diphtheroid bacillus noticed by ourselves occurs in many cases, but has not caused the disease in guinea-pigs, etc. In the opinion of several observers in Jamaica, the cause was probably a variety of spirochæte or filaria. Some glands which had been removed from local cases showed giant cells and other signs of a tubercular nature. The possibility of spirochæte infection by coitus was admitted in each of our cases.

After six weeks' treatment the buboes still remain enlarged, hard and show no signs of suppuration, and will probably remain thus for several months to come.

Treatment.—This is purely expectant. Quinine is useless in combating the fever. Insomnia and headache were relieved by phenacetin and caffeine. Frequent saline purgatives, light diet and prompt removal from the ship to a shore hospital or station are the best treatment. Iodide of potassium is useless as a resolvent of the adenitis, and the cure seems to depend on removal to a cooler climate. Two patients were not sent ashore at Jamaica, but improved very much during the stay of the ship off Havana, where the climate was much cooler and fresher, with crisp, north winds blowing.

Apparently it is not contagious, and there is no need for isolation of the patients. No further cases occurred among the 430 men on board.

Surgical treatment by excision is the best treatment, as the glands tend to break down slowly, and, in reported cases, suppurate and leave indolent fistulæ. A good, short account of the disease is given in Manson's "Tropical Diseases" (1912 edition, page 797).

Reviews.

PRACTICAL SANITARY SCIENCE.

The appearance of a second edition of Dr. Sommerville's "Practical Sanitary Science,"[1] nine years after the first was published, indicates either that no advances have been made in the meantime, or that the demand is limited. The author, in his preface, expressly states that the book is but a brief summary of Department of Public Health work, and advises the student to refer constantly to "up-to-date text-books." The experience gained in a Department of Public Health course of chemistry is insufficient to create a competent analyst out of an average medical graduate. The principal effect of such a course is to enable a medical officer of health to appreciate chemical results intelligently, and to interpret them. Consequently, a practical work of this nature should be brief but complete within limits, well-arranged, lucid, accurate and devoid of unimportant details. Dr. Sommerville's book falls short of this standard. The student is recommended to use Lintner's soluble starch in test for nitrites, but the author does not explain what this is. Evidently it is a case where an "up-to-date text-book" should be consulted.

The method advised for the analysis of sour milk will not give satisfactory results. No mention is made of the freezing point test for added water in milk. This is a notable omission in view of its importance.

The statement appears that ether is convenient for the extraction of fat in milk, on account of its miscibility with water. The miscibility of ether with water is fortunately slight, but such slight miscibility is productive of inaccurate results.

No mention is made of SO_2 as a preservative of meat products nor any method given for its detection and quantitative analysis in foods, a duty frequently falling to the lot of an Australian analyst.

The methods described for analysis of spirits will not give accurate results, especially as regards furfural.

Infants' foods are treated in a general way under the heading of cheese.

Notwithstanding that the author recommends the student to refer to "up-to-date text-books," he has omitted to supply references which would enable him to profit by this undoubtedly excellent advice.

[1] Practical Sanitary Science: A Handbook for the Public Health Laboratory, by David Sommerville, 1914. London: Baillière, Tindall & Cox; 8vo., pp. 328; 79 illustrations. Price, 10s. 6d.

THE HEALTH OF WOMEN AND CHILDREN.

The Annual Report of the Dunedin Branch of the Society for the Promotion of the Health of Woman and Children (New Zealand) was presented at the annual meeting, held at Dunedin on May 19, 1915. This Society was founded in 1907 for the purpose of acquiring information on matters affecting the health of women and children, of diseminating this information, and of employing nurses known as the Plunket Nurses to give assistance and advice in connexion with the care of women during pregnancy and lactation, and the care of the infant. In addition, the Society has undertaken the training of nurses and the institutional treatment of mothers and their babies. Early in its existence, branches were formed, and at the present time there are 21 constituent centres spread throughout the Dominion. Within a few months of its foundation a babies' hospital—The Karitane Harris Hospital—was established in Dunedin. The founder of this Society, Dr. F. Truby King has stated that this hospital was the first institution in Australasia which was devoted exclusively to babies.

At each centre the branch of the Society possesses its office-bearers and committees, and exercises practical autonomy. The objects of the Society, however, are accepted at each centre, and the machinery employed is identical or similar. An annual meeting is held at the majority of these centres, that of the Auckland centre having been held on April 12, 1915. In addition to annual meetings, general conferences have been organized, at which delegates from each branch attend. In July, 1914, the fourth conference extended over a period of four days.

In the annual report of the Dunedin Branch, claim is made that the low infantile death-rate in New Zealand, or rather the continued reduction of the death-rate, is largely due to the efforts of this organization. New Zealand has for some considerable time enjoyed the lowest infantile death-rate in the world. The average for the period 1900-07 in Dunedin was 8%, and since that date this figure has been reduced to 3.8%. In the year 1912-13 the mortality for the whole of the Dominion was 5.1%, which compares very favourably with that of England and Wales (1910) of 11.7%, and of Russia, of about 25%. It would appear that the Society is justified in claiming some of the credit for this happy state of affairs, since it appears that the Government and other authorities have left the subject of infant care largely in its hands. Arrangements have been made for the following up of infants after discharge from general hospital. The services of the Plunket Nurses have effected good work in this way. The sister in charge of the Children's Ward at the Wellington Hospital has been sent to the Karitane Hospital for special training in the care of infants.

The Society has prepared and issued a booklet on "Feeding and Care of Baby." A very large number of copies have been sent to all parts of the world. In July, 1914, it was determined at the general conference that a magazine be issued by the Society. The first number of the *Plunket Magazine* has appeared, and, with the successive issues, will, without doubt, enhance the utility of the Society.

It is reported that 122 babies and 20 mothers have received institutional care at the Karitane Babies Hospital during the year ending March 31, 1915. The average duration of residence of babies was 48 days, and of mothers 12 days. The maximum number of inmates accommodated at one time was 22, *i.e.*, 3 mothers and 19 babies. It is regarded as a healthy sign that the mothers have taken advantage of the opportunities offered in increasing numbers. This is important, not only for the immediate effect on the infant, but also as an educational measure emphasizing the advantage of breast feeding.

Of the 122 babies, 18 died, which is equal to a case mortality of 14.7%. Of the 18 babies who died, 3 survived but a few hours after admission, and in 12 death took place within a week. The causes of death were congenital heart defect, congenital stricture of the œsophagus in one case, and atresia of the œsophagus in another, marasmus, pneumonia, prematurity, congenital tumour, chronic gastro-enteritis, nephritis and bronchitis. Associated with the hospital is the Training School for Mothers. During the year, demonstrations for mothers were held on subjects such as air and ventilation, breast feeding, artificial feeding, care of premature babies, cleanliness and preparation for confinement in a cottage.

As has already been pointed out, the chief activity of the Society is centred in the work of the Plunket Nurses. There are 28 of these nurses distributed among the 21 centres. Dunedin, Wellington and Christchurch have three each, Auckland has two, and each of the other districts have one. In Dunedin, the three Plunket Nurses dealt with 1,219 cases during the year. No less than 9,442 visits to the parents' homes were paid, while the mothers brought their babies on 1,989 occasions to the Society's Room. It is reported that the proportion of nursing mothers is increasing steadily, but extended efforts are required to reach the expectant mother, in order that she may be impressed with the possibility and material advantage of breast-feeding before her baby is born. The nurses record marked success in cases in which they visit the baby during the first month of life. The report gives details of the work conducted in the control of feeding by weighing and keeping proper records. In Auckland, where there are two nurses, 375 new cases were attended to, and 2,921 visits paid.

The question of milk is always a difficult one, and in the various districts in New Zealand the conditions are not uniformly satisfactory. In the annual report of the Dunedin Branch, it appears that the Taieri and Peninsula Dairy Company have entered into an arrangement with the Society for the preparation and distribution of humanized milk. This milk is delivered in a cool and good condition at a comparatively small cost. During the year, 89,391 bottles of this milk were sent out. Sugar of milk (lactose) is manufactured in the Dominion, and is therefore obtainable at a low cost. The retail price is 1s. per lb., and free use is made of the possibility of obtaining a suitable sweetening agent of high nutritive value at a moderate cost. In Auckland, a small supply of excellent milk is available. The firm is a private one, and it is unfortunate that the quantity on sale is so limited.

In the last place, mention should be made of the financial condition of the two Branches, of which the balance sheets have been issued recently. The Auckland Branch has cost close on £405 to maintain. The items of expenditure are small, and no waste appears to have been permitted. The subscriptions for the year amounted to £121 and the donations to a further £18. A balance of £15 was carried over from the previous year, and the end of the year the balance had increased to £33 14s. 3d. The subsidy from the Hospital and Charitable Aid Board amounted to £200, and that of the Government to another £200. These amounts, together with the proceeds of a fête, were paid into a Savings Bank Account, and of the total of £788, £277 were used for current expenses and £342 were carried over to the next year.

The Dunedin Branch costs more to keep up, on account of the Karitane Harris Hospital. The expenditure of this Branch amounted to £2,672 11s. 9d., including close on £200 for printing of the Society's publication, etc. The receipts exceeded the expenditure by about £24. The Government paid a grant to the Society in respect of the hospital of £750, and a subsidy in respect of the Plunket Nurses of £300. The Endowment Fund has been encroached on to the extent of £365, but this fund has increased by £200, while £1,000 will mature as soon as some legal technicalities have been overcome.

Barclay Hector, the late registrar of the University of New Zealand, was charged, at the Magistrates' Court, Wellington, on May 14, 1915, with embezzling the sum of £1027 18s. 10d., the moneys of the Senate. This charge was withdrawn at the instigation of the prosecution, and three others substituted. The charges were (1) that he fraudulently converted the sum of £27 12s. 2d., (2) that he fraudulently omitted to pay the sum of £650 received from the Senate to J. W. Joint, thereby committing theft, and (3) that he committed the same offence in regard to the sum of £150. The accused pleaded guilty, and was committed for trial.

On May 19, 1915, the case was held at the Supreme Court, and Barclay Hector was sentenced to two years' imprisonment with hard labour.

The Medical Journal of Australia.

SATURDAY, JUNE 19, 1915.

The Medical Profession and the War.

According to the Minister of Defence, no less than 500 members of the medical profession in Australia are serving at the front at the present time. This number represents close on 20% of the whole complement, and yet a still larger proportion is wanted. Some few weeks ago, we pointed out that more men were wanted, and, as a result, many of the doctors offered their services. Complaints have reached us that, in numerous instances, these offers were refused or the men received an indefinite reply. Further enquiries elicited the fact that physically fit and scientifically capable men were being told that their services were not required at the time. It was not without some misgivings that we announced this fact, and drew the conclusion that the military authority in Australia would let the profession know when men were really required. It now appears that the information first given was correct, and that the refusal of suitable men was not due to the supply having met the demand.

At the present time, there is a great demand for suitable medical men, both for foreign service and for service at home. Under ordinary circumstances, medical practitioners should apply to the P.M.O. of their districts, and offer themselves for duty either at the front or at one of the base hospitals in the Commonwealth. Should they be refused, or should their applications be shelved, they will be well advised to make direct application to Dr. Cuscaden, Melbourne, who assures us that every physically fit medical man, who is willing to serve, will be accepted. Those desirous of going to the front will be sent out as soon as an opportunity occurs, while others will be called upon to perform the highly important duty of tending to the returned sick and wounded soldiers.

The requirements at the present time may be divided into reinforcements for the General Hospitals, Convalescent Depôts in England, field ambulances, etc., and the equipment of hospital ships. A request for 18 hospital ships has been received, and it is proposed that four medical officers should accompany each ship. It is further surmised that the Defence Department anticipates the organization of another general hospital, and a nucleus, at all events, would be required in advance. A definite announcement will be made at an early date of the strength of the staffs of the base hospitals in Australia.

In view of these facts, it will be seen that, in response to the call, a shortage of medical practitioners for civil, and especially hospital, practice must result. To counteract this anticipated shortage, or perhaps it would be nearer the mark to call it an actual shortage already, the three Australian Universities are taking steps to accelerate the passage of medical students through their curriculum. Objection has been taken to this plan, on the ground that the men qualified after shortened courses will be less well equipped for future practice than men who spend the full time at the universities. A moment's thought will dispel this objection. In the first place, the men at Sydney and Adelaide, and we anticipate at Melbourne also, will relinquish their vacations, and, by working at higher pressure and longer terms, will be able to catch up the work done more leisurely in the usual course. In the next place, the examination will not be altered, and therefore the standard will not be lowered. But even more important than either of these arguments is the fact that a medical man's education is founded at his University, but never completed there. He has to continue working and learning throughout his whole life, and, after some years of practice, the chief use of his student training will be that it has served as a groundwork for the acquisition of theoretical and practical knowledge, rather than as a complete education in itself.

The final examinations for the M.B. degree at both the Sydney and the Adelaide Universities will be held in September, 1915, and March, 1916, and at these examinations students who have volunteered for medical military service and who would have completed their courses in March, 1916, and March, 1917, respectively, will be admitted. At the Melbourne University, the students who would otherwise have presented themselves for examination in March, 1916, will be allowed to go up in November,

1915. We understand that a very large proportion of the fifth year students, and practically all the fourth-year students, have already made applications to the Defence Department. The men who graduate in the near future will therefore not be available for hospital service, as is usually the case, and the great metropolitan hospitals will find themselves seriously understaffed. These difficulties, no doubt, can be overcome, if general practitioners will collaborate with the hospital authorities when the work becomes too arduous for those left in charge. It therefore appears that under the exceptional circumstances of the great war, the medical profession will have to bear a burden of increased work and of sacrifice greater than that borne by the members of any other calling.

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NATIONAL INSURANCE.

The Labour Party has considered the question of the advisability of adopting as a party "plank" national insurance, and has determined to press a bill through the Federal Parliament providing for this expedient. Whether the measure will be presented to the House during the present session, whether the bill has yet been drafted, what its provisions are—all these questions remain unanswered. It would, however, appear that the ruling party in the Commonwealth is determined to force compulsory insurance on the people, and it is to be assumed that the insurance would cover both sickness and invalidity, and that a sickness and a medical benefit would be provided. Moreover, Dr. Cumpston, the Federal Director of Quarantine, in an interview accorded to the representative of the *Sun* newspaper on June 8, has made a significant statement. He said: "A scheme of compulsory insurance applied to the majority of the community would automatically ensure that large numbers of the infected" (he was dealing with venereal disease), "having paid for their medical attention, would avail themselves of the privilege to consult their doctor and if no distinction were made between venereal and other diseases, in respect of payment of sick and other benefits, and no stigma were attached, there could be no valid objection to the scheme. One distinction in this respect should, however, be made, namely, that insurance benefits should be continued only so long as the medical attendant certified that the patient was receiving proper treatment, according to the methods prescribed by the insurance authorities." It thus appears that national insurance on a compulsory basis is regarded as a practical measure on which to hang further proposals, and that the insurance will involve the majority of the community.

No political party can make compulsory insurance a successful business venture unless the medical profession is prepared to lend its assistance. Before the profession will undertake to provide medical attendance under this scheme, it is essential that certain things should be demonstrated. The first of these is that insurance is needed, or is at least a beneficial proposal in so far as the conditions in Australia are concerned. It is quite immaterial whether insurance has been a boon in England or in other countries. It is necessary to analyse the arguments in favour of the scheme, as applied to the Commonwealth alone. The essence of compulsory insurance is that the whole of the wage-earning class should be compelled to make adequate provision against the inexorable effect of sickness. A man with relatively small means, that is, relative to his needs, will find sickness ruinous unless provision be made during health in the shape of insurance. It is of small moment whether the wage-earner is drawing a large or a small wage; the whole question revolves around whether the margin between the wage and the expense of living is small or large. We may therefore accept the proposition that insurance is essential for the wage-earning section of the community all over the world. But it must also be remembered that approximately 33% of the entire population of the Commonwealth have made voluntary provision against sickness through the medium of the Friendly Societies. The action of the British Medical Association within the past few years has been directed toward a reduction of this percentage, in order to limit the contract between the doctors and the community to persons whose income does not exceed £208 per annum, save under special conditions. If it be accepted that the direct effect of compulsory insurance on the insured would be to enable him to live without charity during sickness, and not to owe his doctor

PLATES ILLUSTRATING DR. S. HARRY HARRIS'S ARTICLE.

Fig. 6.

Cystoscopic View of a Stone in the Vesical Portion of the Ureter (Case 1).

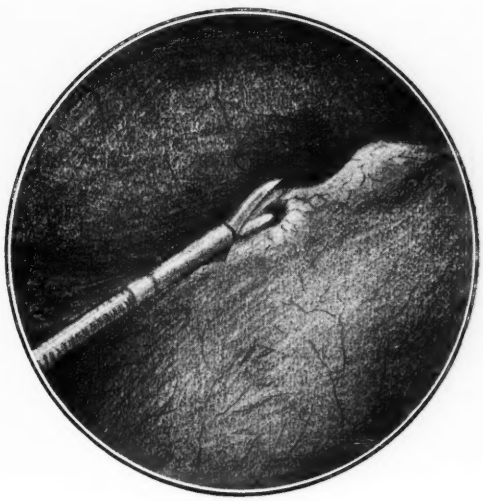

Fig. 7.

Cystoscopic View, showing Scissors introduced into the Ureteral Orifice in the Operation of Ureteric Meatotomy (Case 1).

Fig. 8.

Cystoscopic View after Ureteric Meatotomy, showing Stone impacted above a Stricture (Case 1).

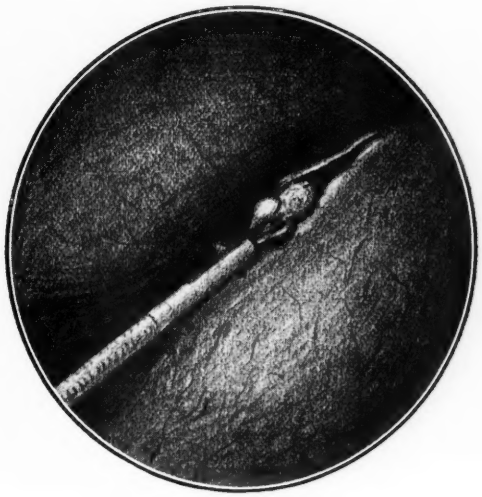

Fig. 9.

Cystoscopic View, showing Forceps in the Act of Removing the Stone after the Ureteral Stricture has been cut with Scissors (Case 1).

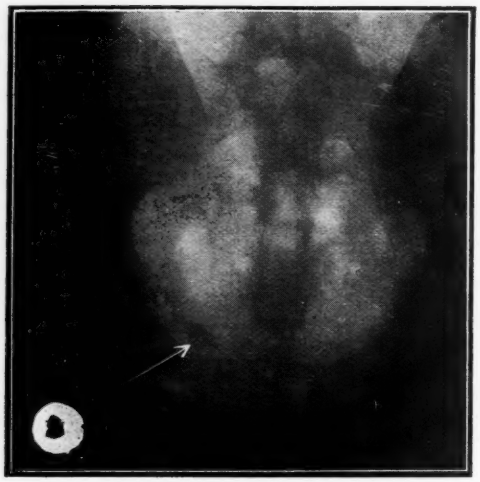

Fig. 10.

X-ray of Case 1, showing Shadow in Lower End of the Left Ureter, which, from its position, suggests a Phlebolith. Cystoscopy showed a Stone in the Lower End of the Ureter, which was removed through the Cystoscope (*vide* Figs. 6, 7, 8 and 9). Inset is the Stone removed (half natural size).

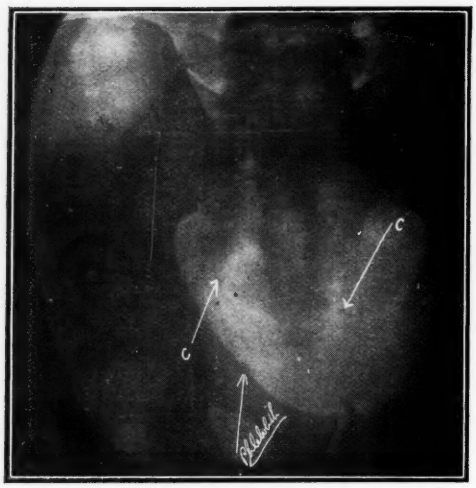

Fig. 11.

X-ray, showing a Calculus in the Lower End of Each Ureter (Case 2).

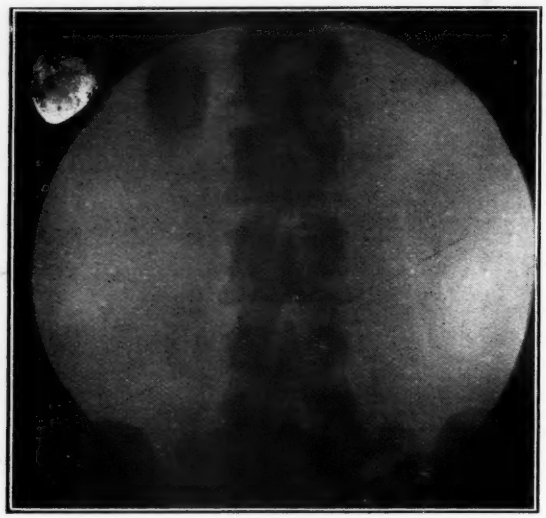

Fig. 15.

X-ray of Case 4, with Stone inset (about half natural size).

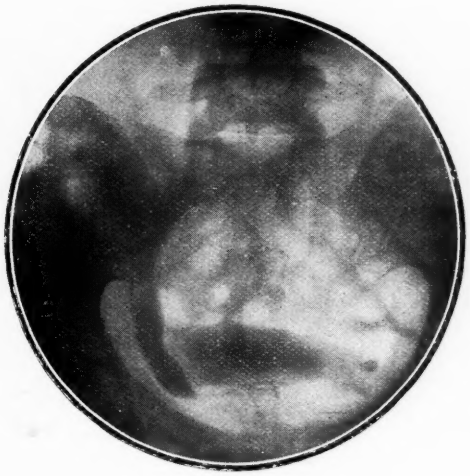

Fig. 12.

X-ray, showing Dilated Ureter filled with Silver Iodide Emulsion and Strictured close to the Bladder, which also contains some of the Emulsion (Case 3).

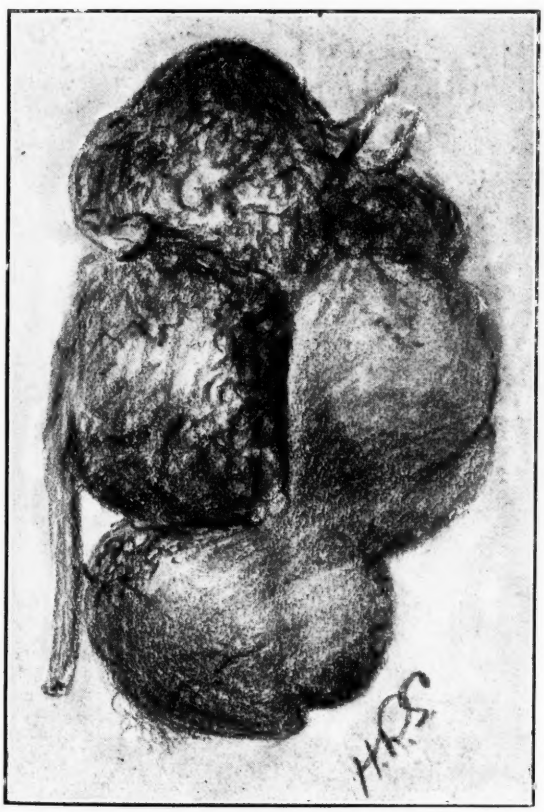

Fig. 13.

Drawing of the Kidney Removed from Case 3, showing Pyonephrosis (about two-thirds natural size).

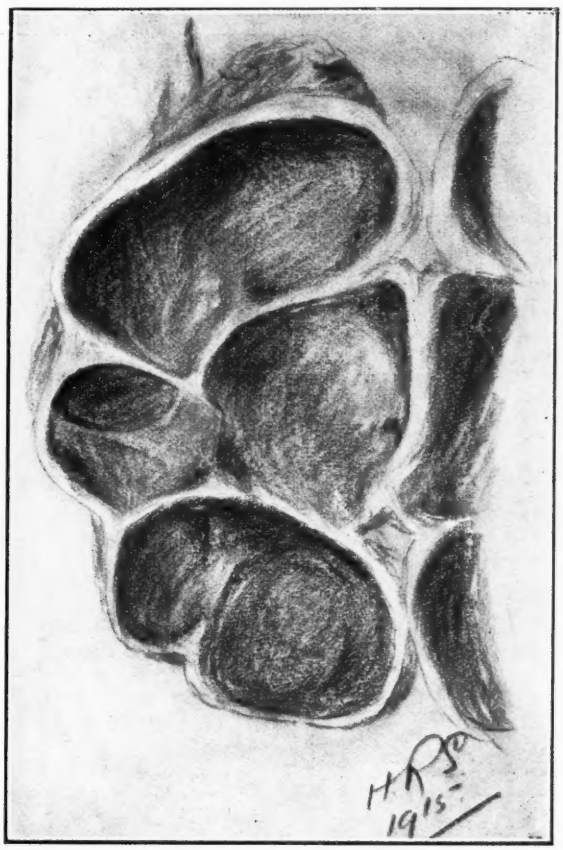

Fig. 14.

Mesial Section of the Kidney shown in Fig. 13.

Fig. 16.

X-ray of Caecum, Ascending and Transverse Colon, after Bismuth Meal, showing Obstruction of Ascending Colon (Case 5).

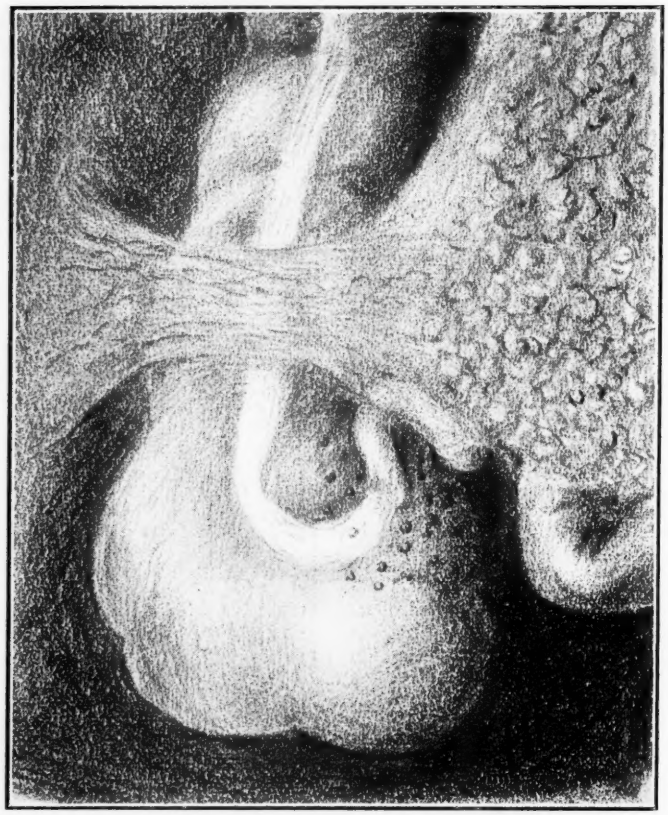

Fig. 17.

Same Case as Fig. 16, showing Operation Findings. Note (*a*) Membranous Band Causing Obstruction of Ascending Colon, (*b*) Dilated Caecum, and (*c*) Miliary Tubercles Scattered Round the Base of the Appendix.

for medical attendance, it is quite obvious that any scheme which would involve the majority of the community would have a most demoralizing effect, and would be to the detriment of the individual. Looked at from the ultimate effect, it has been demonstrated in a clear manner that in countries in which the community is not inclined to make provision against sickness voluntarily, compulsory insurance increases prosperity by cutting off one large source of pauperism, namely poverty due to sickness, and we would therefore place among the first objects of compulsory insurance the necessity of reducing pauperism and of stamping it out. In Australia, there is practically no pauper class. National insurance is therefore not needed for this reason. When Mr. Lloyd George introduced his measure in Great Britain, the primary argument used in its favour was that, while eleven million persons belonged to the class needing a measure of this kind, not five millions were members of Provident Dispensaries, Friendly Societies or Clubs. This does not apply to Australia. What other argument can be adduced in favour of compulsory insurance? We know of none, lest it should be to secure for the working class, the great mass of the Labour Party, a commodity at a low rate of payment. The medical profession will therefore find it necessary to raise the capitation fee under a compulsory insurance much higher than that fixed for Lodge contracts, if the majority of the community is to benefit. Or, perchance, to refuse to work the scheme altogether.

If the Labour Party is prepared to work the insurance scheme without medical benefits, in a manner like that which Mr. Lloyd George threatened to adopt when the British Medical Association raised its voice against the provisions, the profession need not take any immediate active steps. Medical attendance would then be provided by practitioners at ordinary fees charged in private practice, and we presume that the Friendly Society Lodges would cease to exist, at any rate for the provision of medical attendance. How long such a scheme could be run without financial disaster we do not pretend to be able to forecast, but one thing is certain, that the life of national insurance on such an unstable basis would be short.

Dr. Cumpston's utterance raises two points, one of which is germaine to the subject, and the other is too important not to emphasize in this connexion. The first is the suggestion of a collaboration between the insurance authorities and the public health authorities. This proposition is quite new; in no other country has it been attempted, and we have not heard it proposed as a remedy for the evil mentioned by Dr. Cumpston. It is of great importance from the point of view of the health of the community that preventible disease should be notified early and without exception, but further argument will be necessary before it can be admitted that national insurance is needed to effect this end. The second, less direct matter, is the suggestion that benefits should be continued only as long as the practitioner applies the treatment prescribed by the insurance authority. This suggestion should act as a warning. If the insurance doctor is to be told how to treat his patient, national insurance must be resisted by the medical profession with all the force available. The unity exhibited in New South Wales within the profession when the Common Form of Agreement was accepted, proves that the profession is quite strong enough to determine, despite the Labour Party, whether there shall be a compulsory national insurance with medical benefit or not.

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POISONOUS GASES IN WAR.

The publication in *The Times* of April 29, 1915, of Dr. J. S. Haldane's report to the Secretary of State for War on the nature of the asphyxiating gas employed by the German troops is of considerable scientific interest, apart from the national aspect of the question. We learn from this communication that the bronchitis and accompanying slow asphyxiation were due to an irritant gas. Captain Bertram is reported to have observed a white smoke rising from the German trenches. Then, in front of the white smoke appeared a greenish cloud, which drifted along the ground to the British trenches, not rising more than about seven feet from the ground. The symptoms and other facts ascertained up to the time of writing led Dr. Haldane to the conclusion that the German troops were employing chlorine or bromine. Professor Baker, F.R.S., was making further chemical investigations at the time, and Sir Wilmot Herringham, Consulting Physician to the British Forces, was assisting in the clinical investigations.

Some of the men who inhaled the gas died within a short time; others died after a longer or shorter

interval. The signs discovered post-mortem were those of bronchitis and its secondary effects. Captain Bertram himself was much affected by the gas, and felt that he could not breathe.

It may be interesting to recall some facts in regard to the inhalation of chlorine and bromine vapour. The former, when inhaled in a concentration of one part in one million parts of air may give rise to a slight sensation of burning in the eyes and nose. In this concentration the characteristic odour of chlorine cannot be recognized. Two and a half parts per million produce distinct signs of irritation, lacchrymation, smarting of the eyes and irritant cough. It has been found that the average individual cannot tolerate this concentration for more than about 20 minutes. When the concentration is increased to four parts per million, it becomes quite impossible to work. Human beings are extremely susceptible to the vapour, and cats also are very intolerant of it, while rabbits do not react to this concentration save by slowed respiration. On the other hand, it has long been known that workers in factories become quite tolerant to the vapour. A form of chronic poisoning has been observed in men who have been exposed to small quantities of chlorine for long periods. In high degrees of concentration, *e.g.*, 0.2 to 0.3%, death may occur within a few minutes. The symptoms are caused by swelling of the respiratory mucosa. When the concentration is lower, death usually occurs from collapse, resulting from the interference with the respiratory apparatus, or from pneumonia. But even under these conditions, recovery may take place. If the gas employed is chlorine, it would have been present in the British trenches in a concentration varying between 1 part in 1,000 and 1 part in 10,000. Liquid chlorine enclosed in bombs or metal cylinders was obtainable in Germany as long ago as the early 'nineties of last century. The discharge of gas from these cylinders could travel a considerable distance before marked diffusion would occur, and there is no doubt that a concentration of the degree mentioned above could be attained, provided that the cylinders were large, the distance not very great and the current of air preceding the discharged vapour rapid.

The susceptibility toward bromine vapour is approximately the same as that to chlorine. Many persons, however, are exquisitely susceptible, and the smallest trace produces a marked effect on the respiration, eyes and nasal mucosa.

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PHYSIOLOGICAL CLIMATOLOGY IN AUSTRALIA.

During the summer of 1914-1915, Professor W. A. Osborne employed his vacation to make an extended series of observations* on the loss of water from the surface of his body. The skin is a moist surface, and evaporation from it is determined, in large measure, by the physical state of the air—its temperature, humidity and movement. The object of these observations was to obtain data for a comparison of the evaporation from the skin and from an inert, moist surface. A sphere at an elevation from the ground equal to the mean elevation of the human surface under the conditions of the experiment will afford a surface that may serve for such a comparison. The temperature of the air was taken with wet and dry-bulb thermometers, the dew point estimated with a Regnault hygrometer, the velocity of the wind measured with a suitable anemometer and the amount of evaporation with a balance.

The results show clearly that, despite varying humidity and wind-velocity, it is the temperature of the air, under the climatic conditions of the experiment, which is the leading factor in causing evaporation from the skin. The evaporation from the skin is not parallel to that of the inert moist surface. There is a tendency for the rate of evaporation from the skin to increase more rapidly than the speed of evaporation from the sphere when the temperature of the air becomes high.

It is instructive to note the rapid loss of water through the skin on a "hot" day, even when lying in a hammock and quite at rest. With no obvious perspiration, the amount of water lost through the skin in an hour could weigh from a half to three-quarters of a pound, the exact amount varying with the breeze.

* *Journ. of Physiol.*, February, 1915, p. 133

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INSANITY IN WESTERN AUSTRALIA.

The Inspector-General of the Insane (Dr. S. H. R. Montgomerie) has issued his annual report for Western Australia to December 31, 1913. The number of persons certified as insane on the above date was 934, of whom 669 were males and 265 were females. The increase for 1913 was 58 persons. The proportion of insane to sane persons in the total population was 1 in 342. During the year, 230 persons were admitted to the Hospitals for the Insane. Only 28 of these admissions were cases for re-admission. The small number of cases for re-admission is gratifying. Alcohol was entered as the exciting cause in 74 cases. Heredity was regarded as a predisposing factor in 43 cases. The number of patients discharged was 90, of whom 76 were discharged recovered. The proportion of patients recovered to patients admitted was one to three.

During the twelve months, 81 inmates of the hospitals died. Senile decay and general paralysis of the insane accounted for 39 of these deaths. There were five deaths from dysentery, and three from phthisis. One patient committed suicide. During the year, 346 patients were admitted to the Mental Ward of the Perth Public Hospital. Of these, 2 died, 235 were discharged, and 96 were certified and transferred to the Hospital for the Insane.

The amount spent on the maintenance of the patients from July 1, 1913, to June 30, 1914, was £48,455. In estimating the cost of each patient, the revenue paid into the Treasury (£8,786), must be deducted. The annual cost per head, after deducting revenue (3s. 9d. per head) was 17s. In calculating this cost, the general expenses of the Department of Lunacy (£3,348) were not included.

The epidemic of enteric in Auckland, to which reference has already been made, appears to be dying down. Energetic measures have been taken in regard to the water supply of the affected areas, and on May 13, 1915, the engineer of the Manukau Water Supply Board stated that the work had been completed, and that the water in the reservoir had been freed from pathogenic organisms. This was effected by the addition of calcium hydrochlorite.

Four cases were reported to the Health Department on May 12, 1914, two on May 14, and two on May 16, 1915.

The total number since the outbreak of the epidemic is 50. The medical officers of health are urging all householders to boil the water used for domestic and drinking purposes for the present.

TOBACCO FUND.

We beg to acknowledge with grateful thanks the following subscriptions to the fund affiliated with the Overseas Club Tobacco Fund. We wish especially to thank Miss Florence Thomas, aged 4, of Spit Road, Mosman, who has sent 3s. for "smokes" for the soldiers.

Dr. E. J. Jenkins, Sydney (1s.), Dr. T. C. Ker, Bendigo (10s.), Dr. Gilbert Lamble, Melbourne (10s.), Dr. H. Rayson, Nyngan (5s.), Dr. E. R. Sawrey, Melbourne (5s.), Dr. P. E. Walton Smith (5s.), Miss Constance Thomas, Mosman (3s.), Miss A. L. Whitfeld, Sydney (3s.). Total, £2 2s.

VITADATIO.

The Board of Health of New South Wales proceeded against Messrs. Washington H. Soul, Pattinson & Co., Ltd., at the Water Police Court, Sydney, on June 11, 1915, on an information alleging that the defendants had sold a preparation called *Vitadatio*, which was falsely described. It was stated in court that the manufacturer compiled the preparation at a cost of less than 1s. per bottle, that the defendants obtained it at 4s. and retailed it at 5s. 6d., thereby making a profit of 37½% on the sale of a bad article. We have already published the evidence connected with the prosecution of Messrs. Elliott Brothers, Limited, for selling the same preparation (see *The Medical Journal of Australia*, June 5, 1915, p. 533). The defendant firm was fined £10, with 6s. costs.

Naval and Military News.

It is with great pleasure that we are able to announce that Dr. A. Graham Butler has been awarded the Distinguished Service Order for gallantry and bravery while serving with the troops in the Dardanelles.

In a letter written by Trooper G. S. Millar, and published in the *Brisbane Courier*, of June 11, 1915, the following sentence appears: "Major Butler, of the Army Medical Corps, we hear, is recommended for the V.C. He used up all his bandages, then tore up all his clothes to bind up the wounded, and, finding the cheering, charging Australians too much for him, he seized a rifle and bayonet, and, 'stark naked,' led a charge."

In *The Times* of April 30, 1915, the announcement is made that Lieutenant A. C. Hincks, R.A.M.C. Territorial Force (2nd Wessex) has been awarded the Military Cross.

We regret to announce that Captain Edgar Percival, R.A.M.C., M.B., Ch.B. (Edin.), has been wounded.

Through the kindness and courtesy of Mrs. Millard, we are enabled to publish the following abstract from a letter received by her from her husband, Dr. R. J. Millard, Medical Superintendent of the Coast Hospital, Sydney.

. . . . . .

Alexandria, Egypt, May 2, 1915.

. . . . . This has been a wonderful week, so full of action that I have been unable to touch my diary, and can only give you a summary. We left Lemnos about 1 a.m. on Sunday last, 25th, and by 4 a.m. the bombardment at the Dardanelles was audible. By 6 a.m. we were abreast of the point where the British attack was to be made, and could see the warships firing and the troops going ashore. Our destination was about ten miles or so north of this, where the Australian attack was made. We anchored about 8 a.m., only a mile or so from the shore, where the Australians were already attacking up the steep hills and cliffs from a narrow strip of beach. It was the most unique and stirring scene. Battleships alongside us shelling the heights and the concealed batteries and trenches, and our brave men fighting along the ridges. Shortly after we and other transports had come to anchor, big shells began to fall among us, fortunately without hitting anything but water, and we were ordered a little farther out to sea.

At 10 a.m. our bearer division went off, Captains Welch, Wassell and Kay, with 108 stretcher-bearers. We of the tent division could only look on for the present. All day the fight raged along the heights, and far into the night the rattle of rifle fire and the devilish din of machine guns. All day the warships bombarded every likely spot with huge explosions of earth (but not much damage apparently).

On Sunday night wounded were brought off to us unexpectedly, 75, and we had hastily to improvise accommodation in the forward troop deck, and the first and second saloons. I was at work till 3 a.m. on Monday, fixing them up. Ghastly reports came off during the night that our attack had failed, and there was even an order to send all boats ashore to re-embark the troops. I did not dare to think of the scene on the beach if this were so, with all our men huddled together, with the enemy pouring in shrapnel and machine-gun fire. Volunteers were called for, and all our boats went in, but, to their delight, found that it was a mistake, fresh troops were being landed, none coming off.

Next day the fight went on as before, in full view of our glasses; but I was far too busy with our poor wounded to watch much.

Tuesday morning opened with more excitment for us. I was awakened by shells making a curious tearing, screaming noise, but thought, of course, it was our warships' guns, till I went on deck and saw three drop not far from us. Some came very close, one passing between our wireless and the funnel. Of course, we got up anchor and moved about, as did all the other transports. These shells, as on Sunday morning, came over the hills from the ——, lying near the Narrows.

About midday orders came that the Colonel, Poate, Aspinall, and 2 men, were to go on the —— with wounded to Alexandria, and I and 10 men on the ——. They left with our wounded about 4 p.m., but I did not get to the —— till 8 p.m., no launch being available earlier. There I found a ghastly scene. Boat-load after boat-load of wounded arriving all night and until noon next day, until we had 592 all told. To help me I had a R.A.M.C. Captain, Edmunds, and old ships doctor from the "Cardiganshire," and my 10 nursing duty men of B section. Edmunds and I worked solidly all night, and all next day dressing wounds, mostly of a ghastly severity, and my 10 men worked like heroes, but it was a superhuman job. We had every inch of deck space, as well as all cabins filled, beside two troop decks. The wounded were wonderful in the way they bore their sufferings and helped one another. We departed for Alexandria on Thursday, 29th, at 7 a.m., and arrived at 6 a.m. on Saturday. During these two days we buried 30 at sea, mostly men shot in the head, chest or abdomen. Fortunately, we had two chaplains, the Dean and Father McAuliffe on board, who were very useful in taking charge of the matter of getting particulars of the dead, parcelling up their valuables, papers, etc. Our job of doing dressings was continuous, for all the wounds required as much attention as we could give them.

At Alexandria the Territorial R.A.M.C. took off our wounded into hospital trains for Cairo and motor ambulances for Alexandria (the more serious cases). Starting after noon they had our ship completely cleared by 8 p.m., which I thought a very fine performance. I never realized war before, nor how necessary we non-combatant doctors are. The casualties have been very heavy, but the operations were extremely important, and our troops have covered themselves with glory.

THE NEW ZEALAND HOSPITAL SHIP.

According to the New Zealand papers, the work in connexion with the equipment of the hospital ship is well advanced, and the Prime Minister is collaborating with His Excellency the Governor, in order that it may be one of the finest hospital ships afloat. The community is providing the equipment, which it is estimated will cost £25,000. Up to the end of May, close on half that amount had been subscribed. On June 8 the fund had reached close on £20,000. In addition to money, a very large amount of goods have been presented, and an extraordinary degree of enthusiasm is being exhibited by workers of both sexes in various trades and in every station of life.

We have been asked to state that the fund entitled "Gift from the Medical Women and the Wives of Medical Men of New South Wales" will be open to the sisters of medical men in addition (see *The Medical Journal of Australia*, June 12, 1915, p. 560).

Abstracts from Current Medical Literature.

PATHOLOGY.

(199) Wound Inoculation in Carcinoma and Local Cytocides.

Shattock and Dudgeon (*Proc. Royal Soc. Medicine* (Pathol. Section), January, 1915) go fully into the question of wound inoculation in carcinoma, quoting extensively from the literature on the subject. Practically all the authentic cases are instances of auto-inoculation, and full descriptions are given of many specimens in the Museum of the Royal College of Surgeons of England, which illustrate the various examples of this comparatively rare condition. The authors have carried out a number of experiments to ascertain what substances will act as cytocides, thereby preventing infection of a wound from malignant cells liberated during the course of an operation. They found that no cytolytic or cyto-substance was produced by the liver during the growth of mouse carcinoma; also that the blood serum of rabbits prepared to previous intraperitoneal injection of mouse carcinoma had no recognizable effect upon "grafted" mouse carcinoma. They also showed by details of cases and experiments that tuberculosis and tubercle bacilli exerted no specific influence over the growth of carcinoma. Of other substances used as cytocides on small fragments of mouse carcinomatous material, and injected afterwards into other mice, the following gave negative results: distilled water, colloidal mercury, colloidal silver, colloidal silenium, peroxide of hydrogen, radio-active water, and tauro-cholate of sodium. Mercuric perchloride (1 in 500 and 1 in 600) had definite inhibitory effects. An aqueous solution of iodine (1 in 100) allowed to act for four minutes, was an efficient cytocide. An aqueous solution of sulphate of zinc (1 in 240), acting for nine minutes, prevented growth in all the six mice inoculated. Absolute alcohol, acting for eight minutes, prevented growth in ten mice inoculated.

(200) The Bacterial Flora of Wounds Received in War.

Doyon and Yamanouchi (*Compt. Rend. Soc. Biol., Paris*, No. 30, 1914) record the results of 80 complete bacteriological analyses of the saprophytic and pathogenic organisms found in the wounds of soldiers. Aseptic wounds produced by bullets contain no bacteria. Infected wounds yield cultures of saprophytic organisms only occasionally. *Bacillus proteus* was found once, and *bacillus putrificus* several times. The pathogenic organisms found in infected wounds are streptococci, staphylococci, *bacillus perfringens*, and, in cases of tetanus, the bacillus of Nicolaïer. Streptococci are constantly present. They are not virulent, and rarely produce erysipelas. With the streptococci are associated, in all open wounds, staphylococci and *bacillus perfringens*. Wounds infected with streptococci and staphylococci are never fœtid. They heal rapidly with drainage, and do not become gangrenous. *Bacillus perfringens* has been found in all sanious wounds, in cases of local and superficial gangrene, in benign gaseous phlegmon and in fulminating emphysematous gangrene. The biological characters of the bacilli isolated from virulent and mild cases have been found to be identical. The bacillus can live as a saprophyte in pus without forming any gas. The authors do not ascribe the variations in the effects of the bacillus to changes in the virulence of the organism, but to the time of onset in the phagocytic activity of the leucocytes in the tissues. When there is slight injury to the subjacent tissues, the leucocytic response is immediate. When the tissues are crushed and injured, the phagocytic aggregation of the leucocytes is delayed for hours. Under these circumstances, the gaseous phlegmon is developed.

(201) Emphysematous Gangrene.

Harde (*Compt. Rend. Soc. Biol., Paris.*, No. 2, 1915) has made a clinical and bacteriological examination of cases of severe emphysematous gangrene treated by incisions. She recognizes three stages in their course. In the first stage the tissues appear bronzed, and much gas is formed. *Bacillus perfringens* is present, sometimes in pure culture. Leucocytes may be present, but phagocytosis is absent. In the second stage, the formation of gas ceases, and the tissues become necrotic and friable. Ærobic organisms predominate. *Bacillus perfringens* persist in small numbers. Leucocytes are absent, but an abundant exudate may be present. In the third stage the tissues have returned to their normal colour. Leucocytes are numerous, and are actively phagocytic. The microbic flora is that of the second stage.

(202) Pitch-Cancer and the Bases of Coal-Tar.

Norris (*Biochemical Journal*, June, 1914) has tried to isolate the chemical factor responsible for the predisposition to pitch-cancer. Gasworks' coal-tar, the pitch derived from it and soot cause chronic dermatitis and ulcers, leading to epitheliomata in the skins of workmen employed in tar distilleries. Clinical evidence shows that it is only what are known as coal-tar, and the pitch derived from it that have this action; tar and pitch obtained from blast furnaces are harmless. She has examined tar and various fractions separated from tar for the substances known as auxetics, exciting nuclear division in lymphocytes. These substances are found as bases in the anthracene fraction of the tar, from which they are isolated as picrates. The investigator has sought for a means of removing these substances from the tar. They are destroyed in time by oxidation. If the tar is heated and a blast of air blown through the heated tar the oxidation occurs rapidly. The British Home Office are arranging to test this method on the large scale.

(203) Causation of Anaphylaxis.

Weil (*Journ. of Med. Research*, March, 1915) has shown that when a guinea-pig is sensitized by the action of an alien serum, two separate and distinct processes occur. Firstly, the body cells appropriate the immune body, abstracting it from the circulating blood. Secondly, the body cells produce an alteration or activation of the anchored anti-body. This activation is shown by an increased avidity of the anti-body for antigen, and by the induction of a physiological cellular response, such as uterine contractions, when antigen comes into contact with the intracellular anti-body. These changes occur in the latent period of passive sensitization. When the cells have activated the anchored anti-body, the latent period is concluded, and muscular contraction characterizes the reaction between uterine anti-body and antigen. Cellular activation of the anti-body is thus the basis of the anaphylactic reaction.

(204) Action of Sodium Citrate on Widal's Test.

Sartory and Lasseur (*Compt. Rend. Soc. Biol., Paris*, No. 2, 1915) have tested the effects of sodium citrate, in strengths such as are used to prevent coagulation, on the agglutination of the typhoid bacillus. They find that the citrate alone has no action on the clumping of the germs. The addition of sodium citrate to normal serum leads to no power of agglutination, but the addition of citrate to sera possessed of feebly agglutinating powers leads to a great increase in the agglutinating power. This augmentation is so great that false results as to the titre of agglutination are readily obtained. Sera possessed of much agglutinating power are not affected by the addition of sodium citrate. The investigators tried the action of intraperitoneal injections of sodium citrate in producing a serum capable of agglutinating typhoid bacilli. The experiment led to a negative result.

(205) Immunization of Horses by Heated Toxin of Tetanus.

Martin, Salimbeni and Frasey (*Compt. Rend. Soc. Biol., Paris*, No. 3, 1915) have succeeded in immunizing horses against tetanus in three months. The classical method for producing an active antiserum requires five months for the injections of the horses. It has long been known that small animals could be immunized with toxin heated to 60° C., followed by injections of toxin heated to 55° C., and, later, by injections of unheated toxin. The investigators found horses very susceptible to the toxin heated to 55° C. After repeated trials, they have overcome the difficulty. The horses received 500 c.cm. toxin heated to 60° C., six days later 300 c.cm. toxin heated to 58° C., five days later 300 c.cm. toxin heated to 56° C., four days later 50 c.cm. toxin heated to 55° C., and three days later 100 c.cm. toxin heated to 55° C. Thereafter unheated toxin can be injected in increasing doses every three days. The injections were administered intravenously.

PÆDIATRICS.

(206) Prevention of Vulvo-Vaginitis in Children.

Taussig (*Amer. Journ. Dis. of Women and Children*), in his report on 66 cases of vulvo-vaginitis in girls of from three weeks to twelve years of age, considers that the most frequent source of infection is from child to child, through the intermediary of the school lavatory seat. He recommends, as special precautions for its prevention, (1) the instillation of a drop of 2% silver nitrate solution into the *vestibulum vaginae* of all new-born girls whose mothers show evidence of gonorrhœa, though probably not more than 5% of the patients are infected at birth; (2) making vaginitis in children a notifiable disease; (3) instruction of parents of infected children as to the best means of limiting infection, by the use of separate towels, bedding, etc., and by special care in the use of the lavatory; (4) investigation as to the probable origin of infection, in order to prevent infection in other children; (5) the use of a special U-shaped lavatory seat, with a bowl not above eight inches in height wherever children congregate, *viz.*, in schools, picnic grounds, etc.

(207) The Oculo-Cardiac Reflex.

Gunson (*British Journ. of Children's Diseases*, April, 1915) gives the following summary of his investigations on the oculo-cardiac reflex. (1) The oculo-cardiac reflex is a reflex change in the rate of the heart, associated in some cases with a change of rhythm, following ocular compression. The path of the reflex is considered to be along the fifth cranial nerve, the medulla, and the vagus or sympathetic. (2) The reflex affords a simple means, under certain conditions, of acting upon the nervous mechanism of the heart in such a way as to produce all the changes in rate, rhythm and conduction, which follow vagus pressure in the neck. Under other conditions, results analogous to those induced by stimulation of the sympathetic are obtained. (3) The reflex is positive when slowing of the pulse occurs, and negative when either no slowing or actual quickening results. Persons exhibiting the former state are described as vago-tonics, those exhibiting the latter as sympathico-tonics. (4) The reflex is positive in normal persons. (5) The reflex is positive in about 92% of children convalescent from diphtheria and scarlet fever. In about 8% the reflex is negative; these children are of a naturally nervous disposition. In some of the patients the reflex was negative during pyrexia. In cases of so-called "cardiac paralysis," the reflex was negative, and remained so till death in fatal cases. In patients who recovered, the reflex became positive when the heart returned to the normal state. (6) In cases of diphtheria and scarlet fever in which the reflex was positive, the following results were obtained: (*a*) Slowing of the whole pulse, with stoppage of the heart in some cases for as long as four seconds. (*b*) Production of premature contractions in cases in which they were previously absent, and an increase in the incidence of the premature contractions when they were previously absent. (*c*) Reduction of the *a*—*c* interval. (*d*) Production of *c*+*a* beats, due in some cases possibly to escape of the ventricle, in other cases presumably to the inception of atrio-ventricular rhythm. (*e*) in diphtheria patients only, complete dissociation of auricles and ventricles. (7) The claim that the oculo-cardiac reflex is of diagnostic value in differentiating cardiac failure due to myo-cardial lesions from that due to nervous lesions presumes the independence of the muscular and nervous functions of the heart, and cannot be upheld. (8) The oculo-cardiac reflex is of slight diagnostic value in confirming the nervous origin of the great majority of the post-febrile bradycardias, and in differentiating them from cases of auriculo-ventricular heart block. As sinus arrhythmia, however, is present in nearly all cases of bradycardia, due to the former cause, this confirmation is rarely necessary.

(208) The Relationship of "Hilum Phthisis" to the Phthisis of Adult Life.

Allen (*The Practitioner*, April, 1915) considers that in both adult and infantile tuberculosis ("hilum phthisis") the path of infection is identical; in both it is at first pulmonary, and the point of entry is the vicinity of the terminal bronchiole. In the adult, possibly owing to blocking of the lymph paths by a previous lymphangitis, either due to tubercle bacilli or to mechanical irritation, *e.g.*, dust, the bacilli at first remain localized to the neighbourhood of the point of entry, and a bronchiolitis and broncho-pneumonia are produced, which undergo the usual changes of caseation, fibrosis, calcification or softening. In childhood, the above agencies are not called into play to such an extent, so that the infection does not remain local, lymphatic involvement takes place, the glands and the lymphatics themselves in part or throughout the whole of their course are definitely infected. It is not necessary in any case to presuppose, as has been done, a retrograde flow of lymph, which is contrary to all anatomical teaching. The path of infection is always centripetal, and the symptoms and signs will depend on where arrest of the bacillus occurs. In the adult type, this takes place at the beginning of its journey, leading to direct implication of a mucous surface. The patient usually seeks advice, on account of local symptoms, *e.g*, cough expectoration, hæmoptysis. General symptoms appear later on. Physical signs, owing to the situation of the lesion, are sufficiently well marked to enable an early diagnosis to be made by the usual methods of inspection, palpation, percussion and auscultation. In childhood, local symptoms are indefinite. There may be reflex cough and perhaps vomiting, attributed in some cases to irritation of the vagus. General symptoms are more marked. The patient is languid, anæmic, perhaps suffers from night-sweats or slight evening pyrexia and growth and nutrition are interfered with. Physical signs, owing to the depth of the lesions from the surface, are by no means obvious; enlargement of the interspinous area of dulness, with prominent venules over the region of the first to the fifth dorsal spines, crepitations in the nipple region, and harsh or cog-wheel sounds at the apices are the signs which suggest further examination. This is usually by means of the Röntgen rays, when the usual morbid appearances may be disclosed. Adult and infantile phthisis are therefore one and the same disease, the difference in their symptoms and signs being explicable on anatomical peculiarities. The affection in childhood may remain limited to the lymphatic paths, and in this case the prognosis is good, provided the disease is recognized early and treated. Wrongly diagnosed or diagnosed too late, the parenchyma of the lung is affected and the case, perhaps comparatively late in life, passes into the adult variety, with far gloomier prospects of recovery.

(209) Goître in Children.

C. G. Buford (*Surg., Gynaec. and Obst.*, January, 1915) states that simple goître frequently occurs among children in Chicago, and is associated with a definite symptom-complex, pointing to a low state of health. Goître appears in certain districts, usually where the drinking-water is sewage infected, the bacteria or their toxins acting as causal factors in the disease. Infections of the tonsils, adenoids, or teeth may produce goître singly, or, in conjunction with the water supply and the enlargement of the thyroid, is probably an attempt to deal with the increased numbers of organisms and their chemical products. Three classes of cases are differentiated: (1) Goître in infants under twelve months of age. These include cretins (90%) and a few cases in which the enlargement, present at birth, disappeared within two weeks. Malnutrition is usually present in the mothers of these latter. (2) Goître in childhood from one year to adolescence. These cases are of frequent occurrence, with the ordinary constitutional symptoms met with in adults. The swelling usually affects the right lower pole of the thyroid, and is adenomatous. If, as usual, constitutional symptoms are present, the mass should be removed. (3) Adolescent goître. Usually these cases show diffuse bilateral enlargement, with mild hyperthyroidism. Recovery usually occurs, but the type with symptoms of thyroid excess is very resistant. The treatment in Class 1 is reserved for the cretins, with thyroid extract. In Class 2 attention must be directed especially to the drinking water and to various local infections. Thyroid extract is useful. Operation is indicated where there is a definite encapsuled adenoma. In Class 3 rest is essential.

British Medical Association News.

SCIENTIFIC.

A clinical meeting of the New South Wales Branch was held at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, on June 11, 1915, Dr. George Armstrong (the President) in the chair.

Dr. Eustace W. Ferguson exhibited a collection of foreign, blood-sucking flies. He informed the meeting that this collection had been presented to the Department of Public Health by the Imperial Bureau of Entimology, of London. It consisted of blood-sucking diptera, chiefly of African origin, and, in addition, specimens of the chigoe flea (*Dermatophilus penetrans*) and a collection of African ticks.

There were three specimens of the *Simulidae*, commonly known as sand flies or buffalo gnats. These flies were common in other parts of the world, but were rarely met with in Australia. The chief interest attaching to them rested on Sambon's theory of the transmission of the hypothetical organism of pellagra by a species of simulium. He pointed out that a couple of cases of pellagra had been reported from New Zealand, where *S. vexans* is very common.

The major part of the collection consisted of specimens of the *Tabanidae*, commonly known in Australia as March flies. These flies played a very small part in the transmission of disease. The speaker was not aware of any record of disease being spread to human beings by these flies, save those of Leiper, who described two species of *Chrysops* as the host of *Filaria loa*. Various outbreaks of trypanosomiasis in animals have been spread by the tabanids. In the majority of cases the flies act as mechanical transmitters, but it is stated that they functionate as true vectors of *Trypanosoma soudanensi*, in North Africa, in the production of *El Debab*, disease of dromedaries. Surra is also supposed to be transmitted by species of tabanids.

Of the *Muscidae*, six species of glossina were shown. *Glossina palpalis*, the tsetse fly, was of special interest as the transmitter of *Trypanosoma gambiense*, the parasite of sleeping sickness. It also transmitted other animal trypanosomes. Dr. Ferguson described its habitat, and pointed out that it was always found in the neighbourhood of water. *Glossina morsitans*, the transmitter of *Trypanosoma brucei*, the parasite of nagana and *Trypanosoma rhodesiense*, the parasite of the Rhodesian form of sleeping sickness, were also described.

He demonstrated three species of *Stomoxys*, all resembling the widespread *Stomoxys calcitrans*. In the absence of glossina, it is thought that the stomoxys may play a part in the transmission of animal trypanosomiasis. Under experimental conditions *Stomoxys calcitrans* was capable of conveying the virus of anterior poliomyelitis, and it was said to be concerned in the transmission of surra. He demonstrated the genus *Philaematomyia*, which he described as the intermediate form between stomoxys and *Musca domestica*, the common house fly. The larvæ of *Auchmeromyia* (Conogo floor maggot) were unique in the possession of the habit of sucking human blood. The interest attaching to *Cordylobia anthropophaga* was centred in the production of myiasis. The larvæ formed large swellings provided with a central hole through which they breathe. When matured, the larvæ dropped out, and the pupæ were developed on the ground. It was not known how the larvæ gained access to human skin.

Of three specimens of *Hippoboscidae*, one (*H. maculata*), probably transmitted *Trypanosoma theileri*.

Dr. Ferguson showed some specimens of the chigoe or jigger flea (*Dermatophilus penetrans*). This insect was originally an inhabitant of South America, but had been introduced into West and East Africa and India. The male and the unimpregnated female behaved in the ordinary manner of fleas. When impregnated, the female attached herself to the skin and bored her way in until only the tip of the abdomen protruded. While in this position the ova matured, and the abdomen became dilated to the size of a small pea. The presence of this insect gave rise to inflammation and swelling, and severe results followed if it were not removed.

Seventeen specimens, belonging to seven genera of *Ixodidae* were shown. The most interesting was the *Boophilus australis*, the cattle tick of Queensland, which acted as the vector of *Piroplasma bigemium*, the parasite of tick fever. Considerable interest attached to the *Ornithodorus moubata*, the transmitter of *Spirulum duttoni*, the parasite of relapsing fever.

In the place of a discussion, a few questions concerning the practical medical aspects of these insects were asked. Dr. Ferguson pointed out that there was but little danger of the tsetse fly finding a permanent home in Australia. In all methods of combating fly pests, the peculiarities of the life history and breeding-places of the flies had to be taken into account.

Dr. Ralph Worrall read a paper on a case in which he had resected two feet of gangrenous bowel. This paper will be published *in extenso* in a subsequent issue of the *Journal*.

Dr. John Malcolm demonstrated a case of diffuse neurofibromatosis, and Dr. Oliver Latham demonstrated the histological appearances of the nerve tumours. A full account of this case will be published in a subsequent issue.

A meeting of the Queensland Branch was held in the B.M.A. Rooms, Adelaide Street, Brisbane, on June 4, 1915, Dr. Brockway (the President) in the chair.

Dr. Love read extracts from a newspaper with reference to the gallant behaviour of Dr. A. Graham Butler at the Dardanelles, and, on the motion of the President, it was resolved that a cablegram of congratulations, expressing the very great pleasure which the news had given to the members of the Branch, be sent to Dr. Butler.

Dr. Douglas showed for Dr. Thelander a case of *scleroderma* of eighteen months' duration, appearing first after childbirth. Marked improvement had followed thyroid extract treatment.

Dr. Brockway exhibited a case of *leucoderma*.

Dr. Robertson exhibited a piece of styloid process removed from behind the tonsil, where it had been causing pressure on swallowing.

The President made sympathetic reference to the death of Dr. Edith Ure, one of the members of the Branch.

After some discussion, introduced by the President, it was resolved that "all members of the Branch who are willing to do so pledge themselves to become total abstainers during the duration of the war."

Dr. Wilton Love read a paper on "Some Notes on Cases of Sprue Occurring in Southern Queensland." It was resolved that the Public Health Department be approached by the Branch in reference to the addition of sprue to the list of notifiable diseases.

Dr. Brockway read notes on a case of "Intussusception in a Newly-Born Child."

It is proposed to publish Dr. Brockway's and Dr. Love's papers in a subsequent issue.

MEDICO-POLITICAL.

A meeting of the Council of the Victorian Branch was held on June 10, 1915, Dr. Honman (the President) in the chair.

The Secretary reported that the amended scale of fees payable to certifying medical practitioners under the Workers' Compensation Act had received assent on June 9, 1915.

The Council expressed its appreciation of the manner in which the Secretary had organized the dinner given to the medical men going to the front. It was resolved that the surplus funds from each dinner should be placed to a contingent fund, to be used for a dinner to be given to the men on their return.

It was decided that the resolutions of the Council of May 13 with regard to alcohol be printed in the form of a circular and issued to members, with the addendum: "The Council very strongly urges its members to set an example by adhering to the above resolution."

It was resolved to add the name of the Royal Microscopical Society of Victoria to the list of bodies before which members might lecture without having first obtained the sanction of the Council.

The Ethical Sub-Committee submitted its report of the question of protecting the interests of medical practitioners on military service. The recommendations were adopted,

and the Secretary was directed to have the same printed and issued to members. An Excutive Sub-Committee was appointed to give effect to the resolutions as occasion might arise. Any difficult questions were to be submitted to the Ethical Committee for adjudication. The following is the text of the report:—

"The Council of the Victorian Branch of the B.M.A., feeling that the profession is desirous of protecting the interests of medical practitioners absent on naval or military service, has deemed it fit to prepare a series of resolutions for the guidance of its members.

"(1) The fees charged by *locum tenentes* acting for medical men, who are absent on military service, should not exceed those paid under ordinary circumstances.

"It is suggested that members leaving on active service who are in the enjoyment of lucrative practices, will be well advised in dealing generously with their *locum tenentes*.

"(2) Lodge patients transferred from the lists of an absentee on military service to those of another practitioner should not be retained by the latter at the close of his military service.

"(3) Any appointment necessarily vacated by reason of absence on military service should not be retained by the successor at the conclusion of such military service.

"(4) Any medical man who is acting for an absentee on military service should be remunerated fairly for his services, due regard being paid to the expenses and the net profits of the practice during the absence of the medical man on military service.

"(5) With a view to conserving the interest of those members of the Branch who undertake military or naval service during the existing state of war, the rest of the members should individually engage, in the event of being called upon fill their positions or attend their patients, to restore the same to them upon their return to civil practice so far as it may be in their power so to do.

"(6) The Council requests members to exercise a scrupulous regard for the just interests of practitioners absent on military service, and particularly so in the case of those who have not been able to obtain a locum tenens nor to provide for the sale of their practices."

It was decided to inform the Acting Principal Medical Officer of the District of the desire of the Branch to cooperate with the military authority in providing civil medical assistance for the wounded on their return to the State, and in securing men for any military service that might be required. The Council would be prepared to confer with him on this matter.

A letter was read in which the writer complained of the action of several Lodge Secretaries in altering the lists of members in the currency of a quarter, to the financial detriment of the medical officers. The Council determined to advise members that this practice was common, and that they should exercise vigilance. Lodge doctors should enforce the conditions of their agreements strictly.

A communication was received in which Dr. M. Lang tendered his resignation on account of illness. The resignation was accepted with great regret.

The following were elected members of the Branch:—
Ellen Maud Balaam, Melbourne Hospital.
Gweneth Wisewould, Melbourne Hospital.
John Victor Hume Guest, Melbourne Hospital.
Annie Lister Bennett, Melbourne Hospital.
Robert Grieve Woods, Albury.

The following has been nominated for election to the New South Wales Branch:—
Dr. Robert Grieve Woods, Albury.

The following members have been nominated for election to the various offices of the Council of the South Australian Branch for the ensuing year: President, Dr. Joseph Verco; Vice-President, Drs. Lynch and Bonnin; Members of Council (three to be elected), Drs. Burden, Coverton, Gregerson, Harrold, Pulleine, Russell and Sweetapple. The present Honorary Secretary (Dr. H. S. Newland), Acting Honorary Secretary (Dr. A. C. Magarey) and the present Honorary Treasurer (Dr. W. A. Verco) are nominated unopposed. The election will take place at the annual meeting to be held on June 24, 1915.

The Treasurer of the Queensland Branch begs to acknowledge the following contributions to the Belgian Fund:—

		£	s.	d.
	Amount previously acknowledged	109	8	6
Dr.	Bourne, E. E., Brisbane (June contribution)	0	10	0
„	Crawford, J. H., Miles (June contribution)	1	1	6
„	Moray, Jundah (June contribution)	1	1	0
„	Morgan, T. H., Brisbane (June contribution)	1	1	0
„	Priestley, H., Townsville (June contribution)	1	1	0
„	Rodger, D., Brisbane (June contribution)	2	2	0
„	Ross, A. P., Wynnum South (June contribution)	1	0	0
„	Sampson, G. A., Maleny (June contribution)	0	4	3
	Total	£117	19	3

BELGIAN DOCTORS' RELIEF FUND.

New South Wales.

During the week ending June 14, 1915, eleven fresh subscriptions have been received by the Council of the New South Wales Branch in aid of the Belgian doctors. In view of the fact that our colleagues in Belgium cannot hope to support themselves adequately as long as the enemy is in their country, we venture to appeal to members who have not subscribed to send a contribution to this excellent fund.

		£	s.	d.
	Amount previously acknowledged	560	3	6
Dr.	Bell, H. C. R., Sydney	1	1	0
„	Campbell, Alfred, Adelong	2	2	0
„	Dalton, H. M., Murrumburrah	1	1	0
„	Maher, C. W., Sydney	1	1	0
„	Maher, W. Odillo, Sydney	2	2	0
„	Raffan, George, Sydney	1	1	0
„	Smith, S. A., Sydney	3	3	0
„	Simmons, W. F., Summer Hill	2	2	0
„	Veech, M., Sydney	1	1	0
„	Williams, R. O., Goulburn	1	1	0
„	Wilson (Professor), J. T., Sydney	2	2	0
	Total	£578	0	6

Correction.

In last week's issue, Dr. Andrew Norrie's name was erroneously entered in the New South Wales Belgian Doctors' Relief Fund list as Dr. Andrew Norris.

Public Health.

THE HEALTH OF NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the fortnight ending June 7, 1915:—

Disease.	Metropolitan Combined District. Cs.	Dths.	Hunter Riv. Combined District. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	28	3	2	—	31	1	61	4
Scarlatina	207	1	20	—	134	1	361	2
Diphtheria	123	5	17	—	143	5	283	10
Infantile Paralysis	1	—	—	—	—	—	1	—
Malaria	4	—	—	—	—	—	4	—

INFECTIVE DISEASES IN QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending June 5, 1915:—

Diseases.	No. of Cases.
Diphtheria	41
Enteric Fever	9
Pulmonary Tuberculosis	7
Scarlatina	2
Erysipelas	3
Puerperal Fever	2
Infantile Paralysis	2
Varicella	12
Total	78

THE HEALTH OF VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending June 3, 1915:—

	Metropolitan. Cs.	Dths.	Rest of State. Cs.	Dths.	Totals. Cs.	Dths.
Diphtheria	58	4	49	1	107	5
Scarlatina	12	—	13	—	25	—
Enteric Fever	6	—	11	1	17	1
Pulmonary Tuberculosis	18	9	15	2	33	11

THE HEALTH OF AUCKLAND.

The following notifications have been received by the District Health Officer of Auckland (Dr. Hughes) for the month of May, 1915:—

	City. Cases.	Suburbs. Cases.	Country Districts. Cases.	Totals. Cases.
Scarlatina	27	10	8	45
Diphtheria	13	12	34	59
Enteric Fever	7	65	27	99
Tuberculosis	4	13	16	33
Septicæmia	2	1	2	5
Varicella	23	3	2	28

HEALTH OF THE METROPOLIS OF SYDNEY.

The mortality return for May, as supplied by the Government Statistician, shows that 652 deaths occurred in the metropolis, including 30 deaths of individuals previously resident outside the metropolis, and deaths classified as taking place in the islands and shipping in the harbour. Thus, calculating on an estimated population of 752,500, the annual death-rate for the month works out at 10.4 per 1,000 of the population.

Deducting the deaths of persons non-residents of the metropolis in the Mental Hospitals of Leichhardt and Hunter's Hill (Callan Park and Gladesville), and adding the deaths of persons resident of the metropolis occurring at the benevolent asylums, mental hospitals and consumptive sanatoria situated outside the metropolis, the number of deaths was 633, giving a corrected death-rate of 10.094 per 1,000.

Among children under one year of age, 89 deaths were recorded for the metropolis.

There were 1,748 births during the month, giving a rate of 27.89 per 1,000 of the population, which is not satisfactory, being 5% below the average of the previous five years. The infantile mortality-rate was 52 per 1,000 births. The rate is very low, being 19% below the average for May for the previous five years.

Infectious diseases were responsible for 17 deaths, of which 2 were due to measles, 2 to scarlet fever, 3 to influenza, 1 to whooping cough, 5 to diphtheria, 3 to typhoid fever, and 1 to puerperal fever. Diarrhœal diseases were credited with 32 deaths, phthisis caused 45 deaths, cerebral hæmorrhage 37, cancer 54, prematurity 30, senility 37, diseases of the heart and blood vessels 92, pneumonia 34, and Bright's disease 47.

Compared with the average in May for the previous five years, there were increases in the number of deaths from senility, Bright's disease, cerebral hæmorrhage, with decreases in diarrhœal diseases, phthisis, epidemic diseases, and cancer.

Three hundred and sixty-six cases of scarlet fever, 63 of typhoid fever, 240 of diphtheria, 12 of acute malarial fever, and 1 of anterior poliomyelitis, were notified during the month of May.

Nineteen cases of phthisis (consumption of the lungs and consumption of the throat) were notified under the City Council's by-laws, and 14 premises were disinfected by the Council's trained staff after the death or removal of the patients.

(Signed) F. M. SUCKLING,
Acting Medical Officer of Health.

June 12, 1915.

THE NEW REGULATIONS UNDER THE QUARANTINE ACT, 1908-1912.

The Statutory Rules, governing the Quarantine Act, 1908-1912, and known as the Quarantine Regulations, 1915, are 157 in number, and occupy a volume of 52 foolscap pages. The majority of the regulations, however, are identical with those in force hitherto, and, as before, has been classed under seven parts, namely, preliminary, general provisions, quarantine of vessels, persons and goods generally, special measures against plague, miscellaneous, quarantine of animals and quarantine of plants.

The following are the amendments embodied in the new regulations.

A new question to be answered in the Primary Health Report relating to any vessel at its first port of entry to the Commonwealth:—

12. At what ports was drinking water or water ballast taken on board?

Under the heading Bills of Health, paragraph 9 provides for every over-sea vessel arriving at any port in Australia bringing a Bill of Health from the port of departure, and from every over-sea port called at. The bill shall contain information as to the existence or non-existence of smallpox, cholera, plague, yellow fever, typhus fever or any other pestilential disease at or in the vicinity of the port concerned during the fortnight preceding the visit of the vessel. The following addition is made:—

The Bill of Health shall be signed and dated within twenty-four hours before the time of the departure of the vessel from the port to which it refers.

Under the heading Quarantine and Release under Surveillance, the following clause has been added:—

16. (1) The master of any vessel in quarantine may make application for the release under surveillance of any member of his crew who is eligible for release under surveillance. The application shall be in the following form:

I hereby request that the undermentioned member (or members) of the crew of the may be permitted to leave the under quarantine surveillance, and I hereby undertake the responsibility of seeing that each member of the crew so released complies with all the regulations relating to quarantine surveillance.

Name
Address on Shore
Signature of Master
Date

(2) The master shall be responsible for the compliance, by each member of the crew so released, with the regulations relating to quarantine surveillance, but no individual member of the crew shall be thereby exempt from his obligations to comply with those regulations.

In the regulations referring to persons in quarantine, fixing the hours of meals, the following words have been added to 28 (*g*) in respect to passengers other than first-class passengers:

or such other hours as may be arranged by the Chief Quarantine Officer.

Under the same heading, a fresh paragraph (*q*) has been added, to the following effect:—

(*q*) Any person in quarantine wishing to consult the medical officer shall attend at the surgery (except in cases of emergency) at such hours as are appointed by the Chief Quarantine Officer.

The following new clause, dealing with the disinfection of second-hand clothing, etc., has been added:—

52. Any second-hand clothing or any article which, in the opinion of a quarantine officer, is likely to convey the infection of any disease, shall, if the quarantine officer so orders, be disinfected to the satisfaction of the quarantine officer.

A further new clause deals with vessels arriving from proclaimed places [Section 35 (2)]:—

54. The master of every vessel from any proclaimed place, shall, on arrival at the first port of entry in Australia, furnish to the quarantine officer a complete list of all passengers on board, and the full address in Australia of any person who intends to disembark at any Australian port.

The most important amendment of the regulations is

contained under the heading Notification of Cases of Disease by Master. Section 35A of the Quarantine Act reads as follows:—

35A. (1) When a vessel subject to quarantine, or any other vessel, has on board any case of communicable (infectious) disease, and a quarantine officer certifies that measures of quarantine are necessary to prevent the disease from spreading, all such measures for the disinfection of the vessel as are prescribed or as a quarantine officer directs shall be taken, and any persons suffering from, or suspected to be suffering from the disease may be removed to a quarantine station to perform quarantine.

(2) Persons suffering from, or suspected to be suffering from, the disease, shall be deemed to be subject to quarantine, notwithstanding that the disease has not been proclaimed to be a quarantinable disease.

The regulation 56 is worded as follows:—

The master of any vessel in port shall give notice in writing to the Chief Quarantine Officer of the State in which the said port is situated of every case on his vessel of any of the following diseases: Small-pox, chicken-pox, plague, cholera, yellow fever, typhus fever, leprosy, anterior poliomyelitis, cerebro-spinal meningitis, Malta fever, scarlet fever, measles, whooping-cough, gastro-enteritis, typhoid fever, diphtheria, malarial fever, gonorrhœa, syphilis.

Notification of Deaths by Masters of Vessels.

57. The master of any vessel on board of which a death occurs among the passengers or the crew while the vessel is in Australian waters shall immediately report in writing, to the Chief Quarantine Officer of the State in which the death occurs information as to the name of the deceased and the cause and date of the death.

The inclusion of gastro-enteritis has been effected, in order that mild cases of cholera may not be overlooked, while malaria is rendered notifiable in connexion with yellow fever. The section of the Act permits any measure within the scope of Section 4 of the Act, namely, inspection, exclusion, detention, observation, segregation, isolation, protection, sanitary regulation and disinfection of vessels, persons, goods, etc. The regulation aims at the detention for treatment at a quarantine station or observation under satisfactory guarantees that treament will be carried out, and that the spread of infection will be checked as far as is possible, more especially in regard to persons suffering from venereal diseases. In regard to the other communicable diseases, detention will offer no special difficulties, and this will, under ordinary conditions, be carried out at the quarantine station. On the other hand, the regulation, read in conjunction with the Act, empowers the quarantine authority to place a person in a hospital, where adequate treatment can be carried out until such time as the patient is no longer a danger to others.

The following new clauses have been inserted more as a safeguard than as a necessity. They are permissive and administrative.

59. The Minister may—

(1) undertake the preparation of vaccine; and

(2) sell such vaccine at such prices as he determines from time to time; or

(3) at his discretion issue vaccine without charge.

60. Vaccinations may be performed and certificates of successful vaccination issued by quarantine officers at fees determined by the Minister.

The regulations dealing with special measures against plague have been modified in certain details for the purpose of rendering them more effective. The amendments are included in the first three paragraphs of Clause 61:—

61. The master or owner of any vessel in any port in Australia shall—

(*a*) effectively obstruct by means of stout netting or other means all openings or holes in the side of the vessel next to any wharf or lighter or other vessel, and shall keep them so obstructed while the vessel is alongside such wharf, lighter or other vessel;

(*b*) affix and keep affixed an effective rat disc or screen not less than 1 foot or more than 3 feet from the side of the vessel to every rope or hawser connecting the vessel with any wharf or lighter or other vessel;

(*c*) when so ordered by a quarantine officer thoroughly illuminate from sunset to sunrise with electric or other brilliant lights the whole of the side of the vessel next to the wharf or to any vessel or lighter lying alongside.

A new sub-section is inserted in Clause 63, requiring the master or owner of any vessel in any port in Australia, if so ordered by a quarantine officer, to—

(*e*) remove and re-stow or re-arrange, in such a manner as to prevent access or harbourage of rats or mice, any dunnage, rubbish or deck cargo;

(*f*) remove, open up, or otherwise render thoroughly accessible to fumigation any linings, casings, partitions, lockers and similar enclosed spaces above or below deck;

(*g*) protect effectively against the passage of rats and mice all openings other than doors or hatches, which are liable to afford communication for rats from any hold or cargo-space to any other part of the vessel; and

(*h*) protect effectively against the passage and harbourage of rats or mice any specified opening or place, whether below or above deck.

The remaining amendments affect Parts VI. and VII., dealing with the quarantine of animals and of plants, and need not be reproduced in this place.

THE FOOD AND DRUGS ACT, 1908, SOUTH AUSTRALIA.

A new set of regulations under the Food and Drugs Act, 1908, were issued by the Executive Council of South Australia, on February 25, 1915. These regulations are arranged under 80 group headings. In the following, a few of the more important provisions are dealt with.

Labels.

Every package of food for sale shall bear a label on which the name of the substance or product is printed. In the case of compounded, mixed or blended foods, the words, "imitation," "compound," "blend," or the like, must be used, and a statement of the ingredients, with their quantities or proportions must appear. In addition the label must bear the name of the manufacturer, importer, or vendor, and the place of manufacture or origin must be given. Special regulations enact that the required information must be plainly and prominently printed, and that no statement or other description which is false or misleading in any particular may appear. The true weight or measure of the contents must be given either in pounds, ounces, drachms, and grains, or in gallons, quarts, pints, fluid ounces, drachms, and minims. A certain number of foods, which are named, are exempt from the regulations.

Preservative, Flavourings, etc.

The addition of a preservative substance to any article of food, except when specifically permitted by the regulations, is prohibited. The following are deemed to be preservative substances for the purposes of the regulations:—Formic aldehyde, boric acid, hydrofluoric acid, hydrofluosilicic acid, sulphurous acid, benzoic acid, salicylic acid, beta-naphthol, and all preparations, compounds and derivatives of the same. The regulation does not apply to sodium chloride, sodium or potassium nitrate, sugar, spices, wood-smoke, vinegar and acetic acid. When a preservative is used, not more than one kind is allowed, and the label must then bear in bold capital letters of not less than six points face measurements, a statement of the fact that the food contains a certain number of grains of a named preservative to each pound or pint of the food.

Similarly, colouring or flavouring of foods is prohibited save when the food is labelled "artificially coloured," or "artificially flavoured" (or both). A few exceptions include full milk cheese, confectionery, pastry (except colourings which represent the colouring of eggs or chocolate), ice cream, butter, jelly crystals, and raspberry and plum jam. Certain articles may be coloured with caramel.

Metallic Poisons in Food.

In regard to the packages and containers, the regulations prohibit the use of lead or zinc, if these substances come

into contact with the food, and special provisions are made in regard to tin plate. The maximum amount of arsenic, tin or lead passed in any food (if any) is given in a special table. For example, baking powder will not be condemned if it does not contain more than 0.01 grain of arsenious oxide—As_4O_6—per lb. Antimony does not appear to be permitted, even in traces.

Miscellaneous

Various provisions are included in regard to the prescribed size of letter to be used, the use of boiler preservatives, the exposure of insecticides and vermin exterminators, artificial sweetening substances, etc.

Protection of Food from Contamination.

These important regulations require that a person engaged in the manufacture, preparation, packing, storage, carriage or delivery of food for sale, shall keep and maintain his clothing and body clean. He shall not smoke, spit, or chew tobacco while engaged in this occupation. No person suffering from any contagious, infectious, or loathsome disease shall handle food or in any way undertake this occupation. Certain restrictions are placed on the packing of foods. Food for sale must be protected during conveyance or when exposed for sale, and no foods may be returned and stored with other food for sale, or again offered for sale. Adequate protection from flies and dust of food for sale must be provided, and the same applies in regard to protection against rats and vermin. Premises used for the manufacture, preparation, packing, storage, carriage, or delivery of food shall be properly constructed, kept in good repair, and be clean. Rooms used for these purposes may not be used as sleeping rooms, nor may animals be placed in them. Special regulations apply to the proper keeping of vehicles and appliances used in this connexion, and in their limited use. Manure bags may not be used for wheat, oats, maize, potatoes, onions, fruit, or other foods. Oysters and other shellfish shall be opened or dipped in clean water. In regard to serving refreshments, all table-ware and drinking vessels shall be suitably cleaned after use, and table napkins must be washed before they may be used a second time.

Specific Regulations.

Under this heading the definitions and constitution, r composition of articles of diet are dealt with in detail. In the first chapter, flours, bread, and meals are described. Following this, cream of tartar, baking powder, custard powder, infants' food, invalids' food, malt, etc., meat, vegetables, gelatine, fats and oils, margarine, milk, butter, cheese, tea, coffee, cocoa, condiments, sauces, vinegar, pickles, ice cream, spirits, drugs, spirit and alcohol, disinfectants, etc., etc., are dealt with in turn.

Infants' Food.

Infants' food is any food described or sold as an article of food suitable for infants. It shall not contain any woody fibre, nor any mineral substance which is insoluble in acid, nor any preservative substance. In the label attached to every package of infants' food which contains starch, or which, when prepared as directed by any accompanying statement or label, does not conform approximately in proportional composition with human milk, shall be written the words: "This food should not be given to infants under the age of six months, except under medical direction," in bold-faced sans-serif capital letters of not less than six points face measurement. The said words shall be the first words of the label, and no other word or words shall be written on the line or lines. Any infants' food which contains any starch of which fifty parts or more per centum remains unconverted when the food has been prepared as directed, shall be labelled: "Not suitable for infants," in bold-faced sans-serif capital letters of not less than six points in measurement.

Margarine.

The paragraph dealing with margarine contains a definition in the following terms: "The term 'margarine' includes every preparation of edible fat or oil which is intended to be, or which may be used in place of butter, and which contains any fat other than milk fat." Boric acid or boron compound may be added as preservatives, provided that the amount or equivalent amount of boric acid does not exceed 0.3%. The word "butter" or "butterine," and expressions which include or resemble these words, may not be used.

Milk.

The chapter dealing with milk consists of 13 paragraphs. In the first is a definition. It is determined that milk shall contain not less than 12% of total solids, 8.5% of solids not fat, 3.25% of milk fat, and 1% of ash. The addition to milk of any colouring matter, water, heated, skimmed, separated, concentrated, condensed, or dried milk, preservative or other foreign substance is prohibited.

Normal milk is defined as milk containing not less than 3.5% of milk fat.

Artificially heated milk is milk which has been pasteurized, sterilized, boiled, or otherwise heated, but from which a considerable portion of water has not been evaporating. It shall contain not less than 12% of total solids, 8.5% of solids, not fat, 3.5% of milk fat, and 1% of ash.

Cream may not contain any foreign substance, and when described as double cream, shall contain not less than 35% milk fat, or as single cream, not less than 25% of milk fat.

Skim or separated milk shall contain not less than 8.8% of solids, not fat.

Condensed milk, whether sweetened or unsweetened may not contain any foreign substance except cane sugar. In the former there shall be not less than 28% of solids, of which not less than 8.5% shall be milk fat. In regard to sweetened condensed milk, the total of solids shall be not less than 31%, of which not less than 9% shall be milk fat.

Concentrated milk shall contain not less than 37% of total solids, of which not less than 10% shall be milk fat. The methods used in estimating constituents of milk are set forth in detail.

Dried, skimmed, or separated milk shall be labelled "Unfit for infants," and also "Fit for culinary and manufacturing purposes only." No person shall carry for sale in any vessel any skim or separated milk, unless the words "Skim milk" are durably and conspicuously marked on the outside of the vessel. Every person who sells skim or separated milk shall, with every quantity delivered, deliver also to the person receiving it a label bearing the words "Skim milk, unfit for infants" in capital letters of not less than ½in. (48 points) face measurement.

Butter and Cheese.

In regard to butter, the definition given is the clean, non-rancid, fatty substance obtained by churning milk or cream. It shall contain not less than 82% of milk fat, and shall not contain any foreign substance except sodium chloride, harmless colouring matter, and preservative. Renovated or milled or process butter shall be so labelled.

The regulations in regard to cheese are of a similar nature.

Ice Cream.

In the chapter dealing with ice cream, two forms are recognized. The first is standard ice-cream, which is a foodstuff composed of milk and cream with sugar, with or without fresh eggs, flavoured with fruit or with the juice or pulp of fruit, or with nuts, or with harmless vegetable flavouring substances or essences, coloured or not, with harmless colouring substances, and with or without candied fruits, liqueurs or spirits. Standard ice cream must contain not less than 10% of milk fat in the form of cream. Mixed ice cream is a preparation of wholesome foodstuffs, with or without addition of harmless vegetable substances or essences, or of harmless colouring matter. The addition of viscogen, gelatine, or other thickening substances to standard ice cream is prohibited. No person shall refill with ice cream for sale any once-used package which is made wholly or in part of wood, paper, cardboard, or the like absorbent material. When ice-cream is sold under the description of the name of any fruit, the word "Imitation" must be used if the flavouring is not wholly provided by that fruit.

Special regulations have been prepared for the purpose of ensuring cleanliness and freedom from contamination of ice creams. Ice creams shall not be stored, manufactured, or deposited in an open shed or unenclosed place. The room or building in which ice-cream is manufactured, stored, or deposited for sale shall be provided with tight, close-jointed walls and floors. The internal walls shall be

covered with tiles, smooth metal, smooth plaster, cement, or wood, painted or colour washed, or frequently lime-washed. The room shall be well lighted or ventilated, and all the interior surfaces shall be kept constantly clean. The room shall not have any direct communication with a sleeping apartment, stable, privy or water closet, and shall not contain any opening communicating with a drain or sewer. No person engaged in the manufacture or sale of ice cream shall suffer his hands or any part of his person to come into contact with any ice cream for sale. All vessels for containing ice cream shall be kept clean and protected from contamination. No ice cream which has been melted shall be again frozen for the purpose of sale.

Drugs.

Under the heading drugs the regulations require that all preparations shall be standardized according to the latest edition of the British Pharmacopœia, with certain reservations. Cotton seed oil may be used in the place of olive oil or arachis oil for preparations for external use only. When wines of a particular kind are specified, these may be substituted by wines of Australian origin containing not less than 28% proof spirit. Methylated spirit may be used in place of alcohol in the preparation of *linimentum aconiti, linimentum belladonnae, linimentum camphoratum ammoniatum,* and *linimentum saponis.* No drug shall be deemed to be a preparation of chloroform provided it contains not more than ¼% of chloroform. The labels of medicines or medicinal preparations containing any of the following chemical substances or their derivatives, etc., shall bear an announcement of the name of the drug, and the quantity or proportion contained. Acetanilide, aconite, adrenals, amyl nitrite, antimony, arsenic, barium, belladonna, bromine, bromoform, cannabis indica, carbolic acid, chloroform, chloral hydrate, coca, copper, creosotum, cresylic acid, cotton root, cantharides, digitalis, ergot, ether, eucaine (alpha and beta), gelsemium, guaiacol, heroin, hydrocyanic acid, hydroquinone, hyoscyamus, iodine, lead, lobelia, mercury, naphthols, nitroglycerine, nux-vomica, oil of pennyroyal, oil of rue, oil of savin, oil of tansy, oil of parsley, opium, paraldehyde, paraphenylenediamine, phenacetin, phenazone, phosphorus, pituitary extract, pyrogallic acid, resorcin, stramonium, strophanthus, strychnine, sulphonal, thyroid gland, trional, veronal, and other hypnotic, analgestic or antipyretic substances, or any reputed emmenagogues or abortifacients, and other drugs containing any poisonous chemical derivative, alkaloid, glucoside, or similar potent principle thereof. The regulation does not aply to drugs dispensed on a prescription of a legally qualified medical practitioner, nor to a mixture supplied by a registered pharmacist extemporaneously prepared for a specific and individual case, nor to a proprietary medicine compounded by such pharmacist, provided that the formula of such medicine has been deposited with the Central Board of Health.

Disinfectants, etc.

The regulations dealing with disinfectants, germicides, antiseptics, and deodorants include instructions for labelling, and require that the strength and proportion of the active substance shall be stated. When the mixture contains any substance which is likely to inhibit or interfere with the action of the disinfectant or germicide, the fact must be stated. The words "germicide" or "disinfectant" or any other word having a similar meaning, may not appear on the label of the package which contains a substance or mixture incapable of killing the germs of disease.

Vital Statistics.

THE VITAL STATISTICS OF SOUTH AUSTRALIA.

The returns of the births and deaths registered in South Australia during the month of April, 1915, have been published in the Government *Gazette* of May 20, 1915. The figures are given in the usual stereotype manner, but much interesting and important information can be gleaned from the data supplied.

The number of births registered during April, 1915, was 1,014, which is equivalent to an annual birth-rate of 27.6 per 1,000 of population. In April, of 1913, the rate was equal to an annual rate of 30, while in April, of 1911, it was equivalent to just under 25. The figures given for the corresponding month in the six years from 1910 to 1915 vary within small limits.

In the month under review, 355 persons died. The equivalent annual death-rate for April was 9.72 in 1910, 8.66 in 1911, 10.44 in 1912, 10.68 in 1913, 10.56 in 1914, and 9.72 in 1915. The average works out at 9.98 per 1,000 of population. It will thus be seen that neither the birth-rate nor the death-rate has undergone any considerable alteration in six years, in so far as the month of April is concerned.

The infantile mortality was 63 per 1,000 births. Unfortunately, the figures for the previous years are not given. Deaths occurring under one year of age and above 60 accounted for 200 out of the total of 355, or 56.3%.

In regard to the chief causes of death, infective diseases were responsible for 113 deaths. Of these, tuberculosis was the most common, 30 cases of pulmonary and 5 of acute miliary and other forms of tuberculosis occurring. Diarrhœa and enteritis accounted for 34 deaths, 25 in infants under two years of age. Pneumonia caused 16 deaths, diphtheria caused 10 deaths, enteric fever 9, dysentery, erysipelas, non-puerperal septicæmia and puerperal septicæmia caused 2 each, and acute endocarditis one.

From the figures given, it is extremely difficult to ascertain the number of deaths dependent on disturbances of the cardio-vascular apparatus. There were 30 deaths from organic disease of the heart, 18 from cerebral hæmorrhage, 8 from "other diseases of the circulatory system," and one of acute endocarditis, making a total of 57. In addition to these deaths, some of those entered under "Bright's disease" were probably instances of arterial changes.

The last frequent cause of death is classed under the generic term of "cancer and malignant tumours." There were 33 deaths from this cause. Senility, prematurity, congenital debility and a few other states, which should not be regarded as causes of death but rather as predisposing factors, are entered a number of times.

The second and third tables deal with the returns for the City of Adelaide, and for the various wards of the city, exclusive of deaths in public institutions of persons not usually resident in the city. The causes of death and the actual numbers given in the former table are of less interest than those in the latter. It appears that the estimated population of Adelaide is 43,438. The density of population, calculated as persons to the acre, is 11.5. There were 85 births registered in the city. This would be equivalent to an annual birth-rate of 23.4 per 1,000 of population, provided that all the mothers were resident in the six wards.

The deaths numbered 58. The corrected death-rate was therefore equivalent to an annual rate of 16.08 per 1,000 of population. It will thus be noted that the city birth-rate was considerably lower than the total birth-rate, and that the death-rate in the city was considerably higher than in the whole State. This higher rate is not due to tuberculosis. In the whole State, 9.8% of all deaths were caused by tuberculosis; in the City of Adelaide, 6.8% of all deaths were due to this cause, while in the rest of the State, 10.4% were due to tuberculosis. The figures of the total infantile mortality are not given, but it would appear that the cause of the raised mortality in the city is to be sought under this rubric. In as far as diarrhœa and enteritis is concerned, the relative frequency is considerably higher in the city than elsewhere, and the same applies to pneumonia, as well as to conditions peculiar to infancy. No deaths from violence were recorded in the city during the month of April.

EDUCATIONAL CONFERENCE ON TRADE UNIONISM.

An educational conference on Trade Unionism was held on June 5 and 7, 1915, under the joint auspices of the Workers' Educational Association of New South Wales Economic Research Society and the Labour Council of New South Wales. The first two sessions were held at the Trades Hall, and the second two at the University.

The first paper was read by Mr. Meredith Atkinson, M.A., Director of Tutorial Classes in Sydney University, on "Trade Unionism and Co-operation." After a statistical summary of co-operation in Australia, and comparisons with the movement in Great Britain, Mr. Atkinson sought

to account for the slow growth of co-operation in Australia. The chief reasons advanced were historic and political. In England, both trade unionism and co-operation had arisen under the stress of industrial tyranny, an incentive that was largely lacking in Australia. Further, the labour movement in Australia had so completely won political power that it had been led to pin its faith entirely to State action, to the neglect of self-help activities. Though the aggregate achievements of organized labour were very noteworthy, and of great benefit to the community, self-satisfaction, political success, and the system of artificial fixing of wages precluded much further advance without a change of heart and of policy. The speaker affirmed that trade unionism must look to some other field of action, both to save itself from effeteness and to achieve a larger measure of emancipation. That field seemed to be provided by co-operation. Trade unionists would do well to turn their attention to the promotion of industries run by themselves, but always in conjunction with distributive co-operation, for only thus could they have an assured market of the right sort. Such a movement would also provide them with a fine training ground for business and character, which was certainly lacking in the sphere of trade unionism of to-day. Referring to co-partnership, Mr. Atkinson did not see any favourable future before such schemes in Australia, owing firstly to the comparative youth of Australian industries and the spirit of strong individualism, and, secondly, to the existence of a spirit of hostility and suspicion between capitalists and workers, caused in the main by their being ranged into highly organized hostile camps by the system of industrial arbitration.

The majority of the speakers in the discussion which followed were favourable to co-operation, though some criticized it as partaking of some of the faults of capitalism. The consensus of opinion was that something was wrong with the labour movement, and that something should therefore be done to give it new life. Co-operation was at least one avenue of beneficent activity to which trade unionists might well give more attention, and that the two movements might re-act to each other as helpful correctives.

Professor R. F. Irvine read a paper on "Trade Unionism and Efficiency," the special point of which was that trade unionists had neglected to consider the very real relation of trade unionism to the efficiency of a business. While unionism had certainly led to improved business organization and higher individual efficiency, such compulsory progress was not enough. It was true that the suspicion of the workers that their extra efficiency would be exploited by the employers was not without justification, but did not warrant an indiscriminate hostility to all proposals for increasing output. Business organization was not merely a matter for the employer. Failure on the part of the workers to co-operate efficiently would mean a diminished product. Since trade unionism in Australia had achieved most of its traditional aims, the time had surely arrived when it might have more regard to its function in the increase of efficiency, *i.e.*, to the productive as well as the distributive side. Otherwise, abuses, over-lapping, inconveniences, and discomfort would continue to exist. Development of social efficiency was imperative, and with it must come development of personality. The traditional aims of unionism must, therefore, be enlarged so as to include the hundred and one social problems, on the solution of which further progress and welfare depended. This enlargement would mean much more than putting planks, often unseasoned, into a platform.

The discussion of this paper largely concerned itself with efforts of trade unionists to show that the efficiency of the worker was quite high enough, rather missing Professor Irvine's point that the worker would find his real interest in an ever-increasing efficiency, both of himself and the business concern. The great value of the paper was better brought out by the fact that its central problem kept cropping up in every subsequent discussion of the conference.

The last paper of the session was read by the Hon. W. G. Spence, Postmaster-General, on "Trade Union Administration and Industrial and Craft Unionism." After a reference to the historic origin of trade unionism and its insistence on high social standards, Mr. Spence went on to say there were seven hundred and ten separate unions in Australia, while there should not be a third of the number, even if they were not prepared for complete unity in one. The days of purely craft unions had gone. Australian unions controlled Parliament, and most industrial conditions. But they needed a closer unity, like the Employers' Union. Where should they start? They had still many human activities to pursue—the abolition of unemployment, the stoppage of the robbery of the masses by extortionate prices and high rents, etc. Further federation and amalgamation would greatly increase their power. Internal difficulties and the question of local autonomy were not incapable of settlement. The advantages of one big union were the elimination of friction and waste, an immense gain in securing awards, better educational facilities, and many wider opportunities.

A keen discussion was waged between the craft unionists and the industrial unionists. Many admitted the difficulties and anomalies of craft unionism, but pointed to corresponding dangers in the big unions. There was a fairly general agreement that federation and better co-ordination were highly desirable, and would escape most of the problems created by the one big union, in which they saw much possibility of tyranny and unwieldliness.

The second session was held in the Union Hall of the University of Sydney on Monday, June 7, at 10 o'clock. Mr. Rosser acted as chairman.

Mr. Gerald Lightfoot (Federal Department of Statistics) read a paper by Mr. J. T. Sutcliffe and himself on the historical development of trade unionism in Australia. The first industrial union was formed in connexion with the building trades in 1851. The goldfields had attracted to Australia a large number of people seething with democratic discontent. Irish disturbances. Chartism, Continental revolutions and British agricultural depression had inflamed the minds of many diggers. The influx of so many persons led to much building. The earliest unions in Australia were formed in the building trade, during this prosperous period. Their main objective was the eight hours day. During the 'sixties and 'seventies the question of wages came into prominence as a result of unemployment due to the diminished production of alluvial gold. The four main features of this phase of trade unionism were: (1) The eight hours day, (2) the discussion of wages and trade questions, (3) political agitation for labour purposes, and (4) the gradual recognition of the unity of interests of all workers, which lead to the institution of conferences.

In 1879 the first labour congress was held, to deal with matters affecting workers in the presence of workers only. From this date the labour movement gathered way. In 1885 there were 100 unions in existence. These embraced artisans, factory hands, seamen and wharf-labourers in the cities, and miners in the country. The pastoral workers were not organized until 1887. In the same year legal recognition was demanded. The Brisbane Congress decided to draw up a platform for labour. For eight years the labour movement was partly political and partly economic. The collapse of the great maritime strike and of the two shearers' strikes served to emphasize the inadequacy of the strike in dealing with workers' evils. The change from prosperous seasons to lean years increased discontent and unemployment. All well-wishers of the working man advised him to send his own representatives to Parliament to right his wrongs.

This advice, given in 1895, lead to the great political activity of trade unions. In five years the Labour Party was the most powerful political party in Australia. In 1902 the Commonwealth Conferences were instituted. These led to a national organization for Australian workers.

The recent developments of trade unionism have been concerned (1) with the efficacy of legislation to diminish the number of disputes, (2) with the advancement of wages, and especially of the "real" earnings of the work, (3) with more complete organization of the workers and the spread of unionism to unskilled labourers and women, (4) with preference to unionists and the enforcement of this preference in the public services, and (5) with the legal recognition of trade unionism and with legislation to assist its growth and adoption.

A spirited discussion followed the paper. The main result of this discussion was the evolution of the idea that

regulation of prices was the natural corollary of an increase in wages, if the worker was to obtain any advantage from his higher wages.

Correspondence.

LOCUM TENENTES AND THE WAR.

Sir,—"Surgeon Captain's" experience is not a solitary one, as I could quote at least one other case.

Surely this is a case in which the B.M.A. ought to take action, and endeavour—possibly unsuccessfully—to make those exceedingly mercenary members realize how unspeakably mean their conduct seems to the whole profession.

We are apt to cry out about the unprincipled conduct of certain trades unionists, who go on strike when they think they have the employer in a corner, but they are not members of a learned profession.

Evidently, the possession of a medical qualification does not always connote a sense of fair play.

Yours, etc.,

MAJOR, R.A.A.M.C. (Reserve).

June 8, 1915.

Sir,—I notice in your issue of June 5, a letter by "Surgeon Captain" on the subject of the small supply of "locums." His trouble represents only a proportion of the problem, which is sure to become more aggravated every day as the war continues, owing to the unnatural amount of work which is being thrown upon the profession generally through the requirements of the military.

I have noticed in the press shortly before the constitution of every hospital or expeditionary force, a complaint that sufficient medical men can only with great difficulty be obtained, and a call for the services of more of us, and these complaints claim to be at least semi-official in origin; also I see by the papers that medical students at the Sydney University are being rushed through in as much as a year less than what is normally considered necessary to complete the curriculum. On the other hand, I know of several cases of men who have been anxious to get away but have had difficulty in so doing, and who are left in uncertainty for long periods, and some of whom have been called upon at too short notice.

It seems to me that a man should be able to get definite information as to whether he will be wanted within a few days of applying, and should then be given a definite time, say a month, to dispose of or make arrangements concerning the conduct of his practice. This would only be possible by organization, and I would like to suggest that our Association should ask the authorities if there is any shortage of medical men or probability of it, and, if so, offer to relieve them of this task, and undertake, as far as possible, to supply the men as wanted. A great number of us are anxious to go to the war, but do not want to do garrison work. Again, a great number of us cannot possibly go abroad, but would willingly volunteer to give a proportion of our time to garrison work, or to assist in the private work of men who have gone.

I see the Ethical Committee has taken steps to safeguard the man who goes to the front, but still he has to make expensive arrangements for the continuance of his work, as "Surgeon Captain" points out. I know in times of peace there are very many men whose practices do not keep them fully occupied, some from inclination, some from necessity; in fact, I think the man who could not do a little more work is the exception. I think in times such as these that men who are not fully occupied with their own work would be only too pleased to do some of the work of the men who have volunteered, not for their own benefit, but to save the man who has gone losing heavily through his patriotism.

I would suggest that the authorities be asked if the shortage is so great as to necessitate turning out graduates after a course of four years instead of five (which will be very hard on the men themselves in the future), and, if so, that a committee be formed for the purpose of finding out what the resources of the profession are for expeditionary work, and for enlarging these resources by arranging for men who go having their work continued by volunteers from those who cannot go.

If every member of our Association were circularized by committee, asking confidentially whether he would be prepared to volunteer for field or base hospital expeditionary work (and, if so, how much notice he wanted), or if he could not do so, how much time he would be prepared to give for local garrison work, etc., or for doing work for the men who have gone, the authorities would find it easier to find personnel for hospitals, and the burden would be more equally borne by all, also the supply of medical men available for expeditionary work would be tremendously increased, through economizing with the absolutely necessary men who must stay behind for civil work.

Under the present arrangement of men going in haphazard fashion and sacrificing their practices to do so, and of unprecedented numbers of students being rushed through their course, there must be a tremendous lot of hardship inflicted on these volunteers when they do return, and many will be sure to find themselves without employment as the result of their patriotism, and the standard of the profession will be lowered.

Yours, etc.,

"CIVILIAN."

June 4, 1915.

Sir,—Your correspondent "Surgeon-Captain," on the 5th June, takes "Locums" to task for demanding higher fees. He probably does not know or ignores the fact that many "locums" got £10 10s. a week and all extras before the war. I had several myself. As to the "locum" exploiting the principal, it seems to me the boot is on the other foot. I have had offers from principals going to the colours (of £1 1s. a day, etc.), who had practices worth £1,000 a year and more. They forget that the locum, if he is conscientious and experienced, will probably be earning quite that amount for his principal, and perhaps more. The amount he, "the locum," earns, added to the £1 2s. 6d. a day, will probably give the principal quite as much as he would have earned himself, and he would be under no loss. Again, a war "locum" is a very different matter from an ordinary "locum." A man binds himself for twelve months, or for the duration of the war, and then has to look out for a practice for himself, in competition with all the returned men. I have been eighteen years in private general practice, and on two occasions have done intermittent "locum work" for twelve months. I find that, with breaks of work, time lost in travelling, etc., my income only amounted to about £230 a year, and I have a child to educate and a wife to keep. Another loss the "locum" sustains is in unprincipled principals. Thus, I did a locum in an Australian State at some distance, and, on returning, found I was £29 out of pocket. My principal had gone to England before my arrival, and his agent would not deal fairly with me. I know other "locums" who have had the same experience. It may also be news to "Surgeon Captain" that nearly all the "locums" have volunteered for the war, and are as desirous of being accepted as he probably is.

Yours, etc.,

"EXPERIENCE."

June 3, 1915.

THE VICTORIAN REFERENDUM.

Sir,—Four weeks ago, I moved a resolution at the Victorian Branch of the B.M.A., with a view to allowing beginners in practice to apply for positions as lodge surgeons. This was carried, and referred to the Council, which alone has the right, under our constitution, to do anything.

The Council decided to allow the whole of the members to vote by a referendum, and, in doing so, introduced a new and totally different phase into the question already agreed to at a general meeting of members.

Few, if any, practitioners would refuse the claim of a beginner in practice in a town such as this. Here, if a man could not obtain lodge appointments, he could not commence practice at all.

We surely all think of a young doctor who is doing his duty to the Empire by going to the front and keeping us safe in Australia. Surely it would be a reproach to us for him to say that we had entrenched ourselves in our

practices, while he was away, risking his life for us. But the Council has asked us to vote on this clause, coupled with a second clause that allows a man, already in practice for many years, to apply for positions he has not yet got. If this be carried, no man will know when his neighbour will try to get his appointments. A doctor earning perhaps £2,000 a year will be given the power to apply for the position held by a man earning much less. No man's position will be secure. Surely the Council must recognize the difference between (1) a beginner in practice trying to start in life, and (2) an old-established practitioner trying to collar another man's appointments.

The only way this referendum could be indicative of the real feeling of the members would to put both clauses separately. I am in this position, that, as the father of the first-mentioned clause, I am in favour of any man starting here against me, but I strenuously object to the established men applying for each other's appointments at the present juncture.

I shall vote "No," trusting that at an early date the Council will give us a chance of voting on the question of allowing beginners in practice to apply for lodge appointments.

Yours, etc.,
DAVID ROSENBERG.

Richmond, Victoria, June 11, 1915.

Medical Appointments.

Dr. Thomas Wilson has been appointed District Medical Officer and Public Vaccinator, New Norcia, Western Australia.

Dr. Robert Joseph Silberthau has been appointed Resident Medical Officer at the Fremantle Public Hospital.

Dr. Alfred Edward Morton has been appointed Officer of Health to the Bullfinch Local Board of Health, Western Australia.

Dr. Gellé has been appointed Medical Officer of Health at South Perth, Western Australia, in place of Dr. Teague, on leave.

Dr. Thomas Joseph Hollow has been appointed Medical Superintendent of the Hospital for the Insane, Mont Park, Victoria, in place of Dr. H. Rogerson (transferred).

Dr. Cedric Watson Gray Roche has been appointed Medical Superintendent of the Hospital for the Insane, Beechworth, Victoria, in place of Dr. T. J. Hollow (transferred).

Dr. John Charles Catarinich has been appointed Medical Superintendent of the Hospital for the Insane, Beechworth, in place of Dr. Roche.

Dr. R. G. St. J. Naylor has been appointed Senior Medical Officer of the Hospitals for the Insane at Mont Park and Preston, Victoria, in place of the late Dr .G. H. S. Zichy-Woinarski.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

Camooweal Cottage Hospital, Medical Officer.

Correction.

Dr. Sear has called our attention to the fact that Nos. 5 and 20 of his radiograms published in connexion with his paper on "The Röntgen Ray Diagnosis of Surgical Diseases of the Stomach and Duodenum" (June 5, 1915) have been printed upside down.

Diary for the Month.

June 24.—S. Australian Branch B.M.A., Annual Meeting.
June 25.—N.S.W. Branch, B.M.A., Ordinary.
June 29.—Vict. Branch, B.M.A., Eye and Ear Section.
June 29.—N.S.W. Branch, B.M.A., Organization and Science Committee, Medical Politics Committee.
June 30.—Vict. Branch, B.M.A., Council.
July 2.—Q. Branch, B.M.A., Monthly.
July 6.—N.S.W. Branch, B.M.A., Clinical Evening.
July 7.—Vict. Branch, B.M.A., Monthly.
July 8.—Vict. Branch, B.M.A., Council.
July 9.—S. Aust. Branch, B.M.A., Council.
July 13.—Tas. Branch, B.M.A., Monthly and Council.
July 14.—Melb. Pædiatric Soc.
July 16.—Western Med. Assoc. (Cowra), N.S.W.
July 16.—E. Suburbs Med. Assoc., N.S.W., General.
July 17.—N. Suburbs Med. Assoc., N.S.W., General.

Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
QUEENSLAND. (Hon. Sec. B.M.A. Building, Adelaide Street, Brisbane).	Brisbane United F.S. Institute. F.S. Lodges at Longreach.
WESTERN AUSTRALIA. (Hon. Sec. 230 St. George's Terrace, Perth).	Swan District Medical Officer. All Contract Practice Appointments in W.A
NEW SOUTH WALES. (Hon. Sec. 30-34 Elizabeth Street, Sydney).	Australian Natives Association. Balmain United F.S. Dispensary. Burwood District F.S. Institute. Canterbury United F.S. Dispensary. Goulburn F.S. Association. Leichhardt and Petersham Dispensary. M.U. Oddfellows Med. Inst., Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. Mullumbimby District Friendly Societies. N.S.W. Ambulance Association and Transport Brigade. N. Sydney United F.S. People's Prudential Benefit Society. Phœnix Mutual Provident Society. F.S. Lodges at Braidwood. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Mudgee. F.S. Lodges at Orange. F.S. Lodges at Parramatta, Penrith, and Auburn. F.S. Lodges at Wellington. Killingworth Colliery, Newcastle. Seaham Colliery No. 1, Newcastle. Seaham Colliery No. 2, Newcastle. West Wallsend Colliery, Wallsend.
SOUTH AUSTRALIA. (Hon. Sec. 3 North Terrace, Adelaide).	The F.S. Medical Assoc. Incorp., Adelaide.

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this Journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to "The Medical Journal of Australia" alone, unless the contrary be stated.

All communcations should be addressed to "The Editor," "The Medical Journal of Australia," B.M.A. Building, 30-34 Elizabeth Street, Sydney, New South Wales.

The following periodicals are required by the Librarian of the New South Wales Branch of the British Medical Association to complete the series for binding. Members who have borrowed these journals are requested to return them as soon as possible.

Lancet, November 7, 1914.
Lancet, November 14, 1914.